ARITHMETIC FOR *Today* 5

BY

THOMAS J. DURELL

Assistant State Commissioner of Education
In charge of Elementary Schools
Trenton, New Jersey

ADALINE P. HAGAMAN

State Helping Teacher
Somerset County, New Jersey

JAMES H. SMITH

Director, Training School
Oshkosh State College
Oshkosh, Wisconsin

CHARLES E. MERRILL BOOKS

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Foreword to the Teacher

Arithmetic has an essential place in child development. Children need arithmetic for practical competence and to enrich their thinking and living. An understanding of number relationships contributes to a child's emotional security.

Arithmetic in the Fifth Grade

Most pupils entering the fifth grade have probably learned how to use all the number facts in adding and subtracting 4 and 5-figure numbers, in multiplying by 1 and 2-figure numbers, and in dividing by 1-figure numbers. Through new experiences, the pupils will now recall these facts and skills with a more mature understanding of the number relationships involved. They will extend their use of division into dividing by 2-figure numbers. This is one of the principal sequential learnings of the year.

These pupils have had many experiences with fractions. Now they are ready and able to organize these learnings; and another major sequential learning of the year is the addition and subtraction of fractions, with functional multiplication introduced. Decimals, too, are introduced near the end of the year as another way of adding and subtracting tenths and hundredths.

Arithmetic Experiences Should Be Meaningful

As they recall and extend their computational skills, the pupils should continually apply them in solving problems within their experiences. Problem solving of this kind enables pupils to maintain skills, makes the four processes more meaningful to them, and helps them use arithmetic more intelligently in their living. The chief emphasis in problem solving this year is on problems with two or more steps and in using mental arithmetic to work problems without depending on pencils.

During the year, pupils will increasingly need to use measures in their daily activities. As they work with various units of measure (length, weight, liquid and dry measure, time, heat), they should now be able to generalize about the relationships, such as the inch, foot, yard, and mile, and use these measures competently. New learnings in measures this year are measuring perimeters and using graphs and scale drawings.

This Book Provides a Complete, Modern Program

Pupils learn best and retain longest what they understand and use. This book provides this kind of functional, meaningful program. In it, arithmetic is taught in close connection with pupils' experiences at every step, so that pupils really understand what they are doing.

Many common experiences of pupils are built into the book, but no textbook can, of course, include all the number experiences which

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are peculiar to every locality. In the detailed **Teachers' Manual** which has been prepared to accompany this book, concrete suggestions are given for taking advantage of experiences in the local environment.

A New Kind of Manual The manual guides you specifically in helping every pupil make effective use of each page of this text. For each page, the Guided Learning suggestions cover Step 1: preparation for using the text ("Before Using the Book"); Step 2: the actual use of the book ("Using the Book"); and Step 3: group and individual follow-up activities ("After Using the Book").

There are social as well as learning advantages in having children attack a new topic together. The thinking of one pupil stimulates the thinking of the rest. For this reason, the first two steps should be carried out with the entire group. The pupils can later work in smaller, flexible groups for the follow-up activities.

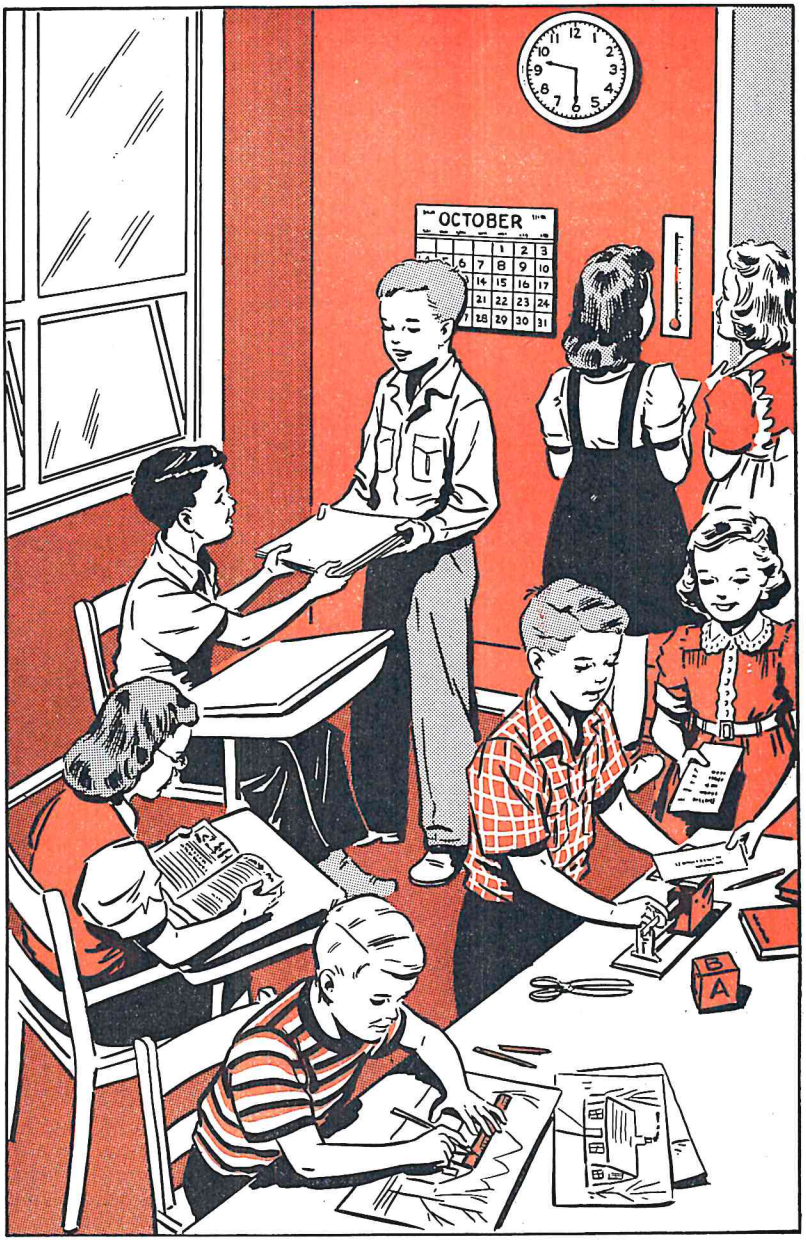
Providing for All Levels of Ability There is ample material in this book to meet the needs of fifth-grade pupils. The book is outstanding in the way it provides for *all* levels of arithmetic ability and interest. (1) For pupils who need additional practice, the manual provides more practice in Step 3. (2) For pupils who are able to explore arithmetic ideas further, the text includes 58 pages of specially planned "enrichment material" (pages 254-311). These pages at the back of the book are keyed by footnotes to appropriate pages throughout the text.

Arithmetic Learnings Are Interdependent The scope of the learnings for the year, and the principal topics, will be found in the index on pages 313-316. For convenience of reference, the topics are listed alphabetically. Learnings in arithmetic, however, are interdependent, and require an organized program. An understanding of arithmetic is achieved by definite sequential steps. Each step leads to the next. *For this reason, it is important that you follow the order of topics as presented in the book.*

All Pupils Should Enjoy Arithmetic If pupils are successful, they will enjoy arithmetic. Each topic in this book starts with easy work so that every pupil can achieve initial success, and thus gain confidence in arithmetic.

No pupil should fail arithmetic because of reading difficulties. The reading vocabulary in this book, therefore, is very simple, and new arithmetic words are carefully introduced. Any reading difficulties that may be met should be attacked like any other reading problem. Under teacher guidance, pupils should first read silently to find out what they are to do. They should then discuss what they have read, including in the discussion any unfamiliar words or ideas they have met.

Cumulative Recall and Diagnostic Testing Cumulative reviews have been built into the text to help pupils maintain learnings. In addition, four sets of diagnostic "Check Tests" are provided to help you and the pupils discover how much they have learned and to diagnose their needs.


OCTOBER
B
A

Using Arithmetic in School

You need arithmetic every day. The picture suggests some ways you use arithmetic in school. The problems on this page tell how some school children used arithmetic. See whether you can work these problems as "quickies." Just tell the answers or write them on your paper.

1. It takes Bill 15 minutes to walk to school each day. If school starts at 9:00 a.m., what is the latest time that Bill can leave home and still not be late?

2. The temperature in a schoolroom should be kept as near 68° as possible. This afternoon the thermometer says 77°. How many degrees too warm is the room?

3. Ann has 12 words in her spelling list that are giving her trouble. If she learns 3 of these words a day, how many days will it take her to learn them all?

4. Nora is reading a book for a report to the class. The book has 256 pages. She has read 145 pages. How many pages does she have left to read?

5. For lunch, Jean paid 10¢ for a sandwich, 6¢ for some soup, 6¢ for some milk, and a nickel for an apple. How much did Jean's lunch cost?

6. Tom is helping to give out supplies. There are 32 boys and girls in the class. If each one gets 3 sheets of drawing paper, how many sheets will Tom need?

7. In October, the class counted on the calendar. It was 25 days to Halloween. How many weeks was this, with how many days left over?

8. The class decided to have hot chocolate at the Halloween party. If one gallon is enough for 16 people, how many people will two gallons serve?

Adding Helps You Subtract

	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	9	10	11
3	4	5	6	7	8	9	10	11	12
4	5	6	7	8	9	10	11	12	13
5	6	7	8	9	10	11	12	13	14
6	7	8	9	10	11	12	13	14	15
7	8	9	10	11	12	13	14	15	16
8	9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17	18

Have you ever used one of these "magic number tables?"

Look at the colored 13. Do you see how the 13 shows that $6 + 7 = 13$, $7 + 6 = 13$, $13 - 6 = 7$, and $13 - 7 = 6$?

1. The sum of 8 and 7 is shown in two ways. You can use *(1)* the row with the 8 at the left and the column with 7 at the top, or *(2)* the 7 at the left and the 8 at the top. At what number do the row and column meet each time? What two addition facts does this show? What two subtraction facts?

2. To find the difference between 14 and 8, find the 14 in the 8 row and see what number is at the top of that column. What four addition and subtraction facts does this show?

Copy and finish these facts that belong together.

3. $4 + 6 = ?$ $6 + 4 = ?$ $10 - 4 = ?$ $10 - 6 = ?$

4. $9 + 5 = ?$ $? + 9 = ?$ $14 - 5 = ?$ $? - 9 = ?$

5. $8 + 9 = ?$ $? + ? = ?$ $17 - ? = ?$ $? - ? = ?$

6. $7 + 4 = ?$ $? + ? = ?$ $? - ? = ?$ $? - ? = ?$

Do You Remember Addition Facts?

Copy and write the sums. Use the table on page 2 only if you have to. Learn any facts you have forgotten.

	a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*
1.	3 6	7 9	3 8	7 2	6 6	7 3	5 4	1 9	4 3
2.	2 8	4 4	9 9	6 5	4 8	6 3	7 5	5 3	3 7
3.	4 9	8 3	7 7	9 1	6 9	9 2	5 5	2 9	8 2
4.	5 7	9 6	3 9	8 4	9 3	9 7	5 6	9 5	8 8
5.	9 8	7 6	5 8	8 7	5 9	6 4	6 8	4 7	9 4

Do You Know Subtraction Facts?

Copy and write the remainders. Use the table only when necessary.

	a	*b*	*c*	*d*	*e*	*f*	*g*	*h*
1.	8 5	12 3	9 7	11 9	15 6	10 7	9 4	12 5
2.	12 8	10 5	11 6	12 7	8 6	16 9	9 6	11 3
3.	15 9	9 5	10 9	16 7	12 6	7 3	10 8	13 4
4.	10 3	16 8	9 2	10 1	12 9	11 2	8 3	12 4
5.	11 5	18 9	7 5	14 7	9 3	11 8	10 2	13 9

Addition and Subtraction Facts

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1. Do you remember how to use addition facts in adding larger numbers by endings? This number table will help you. When you add 6 to 28, do you see why the sum is 34, not 24? From the table, find the sum of 39 and 7.

Copy these examples and find the sums.

	a	*b*	*c*	*d*	e	*f*	g
2.	13 7	24 8	29 4	19 5	23 9	35 6	38 8
3.	27 7	26 4	37 5	15 8	24 5	28 7	17 9
4.	33 5	29 6	16 7	39 1	42 7	19 9	35 5
5.	28 5	44 9	37 8	17 6	25 9	43 9	32 9
6.	56 9	42 8	68 9	36 8	88 3	56 6	79 8

Do you remember how to use addition facts in adding columns? Copy these examples. Add *down* and check or prove your answer by adding *up*. Why should you get the same answer both ways?

	a	b	c	d	e	f	g	h	i
7.	6	5	4	4	9	3	4	9	5
	5	3	4	7	3	4	6	8	7
	7	4	7	8	5	4	7	3	9
8.	3	6	9	6	5	3	8	7	6
	8	2	2	6	4	3	1	9	5
	6	7	3	6	5	9	4	3	5
	2	7	6	4	7	8	2	6	4
9.	8	8	7	8	4	2	5	9	8
	8	2	8	5	9	3	2	7	9
	1	6	9	7	9	6	6	3	4
	3	7	3	4	4	9	8	9	8
	5	6	5	8	2	8	4	6	3

10. Look at the number table on page 4. When you subtract 6 from 34, do you see why the remainder is 28? $44 - 6 = ?$ $24 - 6 = ?$ $54 - 6 = ?$ When you subtract 6 from a number ending in 4, the answer ends in what figure?

Copy these examples and subtract.

	a	b	c	d	e	f	g
11.	24	29	21	31	40	27	31
	5	5	9	2	9	2	7
12.	52	40	78	62	81	30	47
	6	3	7	4	5	8	9
13.	90	27	32	53	83	61	36
	5	8	5	6	9	6	7

Addition and Subtraction Quickies

Here are some "quickies." See if you can find all the answers without using your pencil. You use addition to solve some of the problems and you subtract in the other problems. Decide which process you should use in each problem.

1. Dave collects paper match folders. He had 59 folders yesterday. Today his uncle gave him 5 more folders from places he had visited. How many match folders does Dave have now?

2. Barbara is 60 inches tall. Linda is 2 inches shorter than Barbara. How tall is Linda?

3. Jim weighs 82 pounds. Larry says he is 6 pounds lighter than Jim. How many pounds does Larry weigh?

4. Don's dog weighs 22 pounds. Sue's cat weighs only 7 pounds. How much heavier is the dog than the cat?

5. Judy is six years old today. She already had 19 dimes in her dime bank. Then her father gave her 6 more dimes for her birthday. If Judy puts all 6 dimes into her bank, how many dimes will she have in her bank?

6. This morning, Don picked 30 ears of corn in his garden. He has sold 9 ears. How many ears of corn does he have left?

7. Jerry collects stamps. He has a book in which he keeps duplicate stamps for trading. There were 28 stamps on one page of his trading book one day. Then Jerry traded 6 of them to Bill. How many stamps were left on the page?

8. There were 18 stamps on one page of Jerry's big stamp album and 9 stamps on another page. How many stamps were there on both pages?

9. Bob raises chickens. He had 35 baby chicks. Then one of his hens hatched 8 more chicks. How many baby chicks did Bob have then?

10. One day, Bob's hens laid 13 eggs. The next day they laid only 7 eggs. How many more eggs did Bob get the first day than the second day?

11. In Problem 10, how many eggs did Bob get both days?

12. Sally's mother sent her to the store with a half dollar to buy oranges. After Sally bought the oranges, she had only 6 cents left. How much did she pay for the oranges?

13. There are 61 books in the classroom library in Nora's room. Nora is the librarian. She has charged out 7 books to children who want to read them. How many books should there be in the library now?

14. The first chapter in the book Nora is reading has only 7 pages. The second chapter has 12 pages. How many pages are there in the first two chapters?

15. In another book which Nora owns, Chapter II starts on page 9 and Chapter III starts on page 23. How many pages are there in Chapter II?

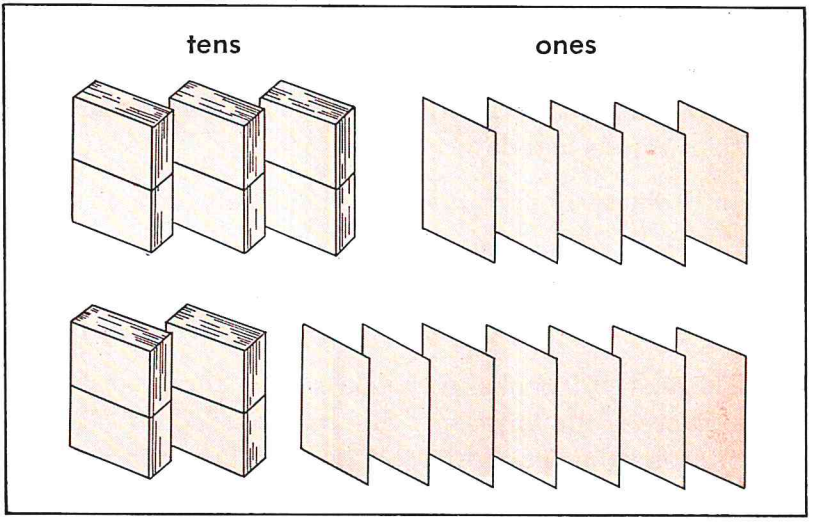
16. Sue made 16 gingerbread animals and 8 gingerbread men. How many gingerbread cookies did she make in all?

17. One day, Sue made 30 pieces of fudge. She gave her friends 8 pieces. How many pieces did she have left?

18. Dick is making a bookshelf. From a board 36 inches long, he cut off a piece 9 inches long for an end board. How long was the board he had left?

19. Bill was throwing darts at a target. He threw 20 darts and 6 of them missed the target. How many hit?

Do You Understand Carrying?



1. Sam and Bob helped take in tickets for the school play. They counted the tickets, putting 10 in each bundle. Sam took in the tickets shown at the top of the picture. Bob took in the tickets shown in the lower line of the picture.

How many tickets did Sam take in? How many tickets did Bob take in?

The boys put their tickets together. The tickets in the ones column made 1 bundle of 10, with 2 tickets over. How many tickets did both boys take in?

$$\begin{array}{r} 48 \\ 39 \\ 37 \\ \hline 124 \end{array}$$

2. Three buses carried the children from Joan's school on a trip to the zoo. There were 48 children in the first bus, 39 in the second, and 37 in the third. To find how many children the three buses carried, add 48, 39, and 37.

First, add the ones column. How many *tens* do you carry to the tens column? Now add the tens. How many hundreds do you carry? The answer has ? hundred, ? tens, ? ones.

3. Copy in columns 419 + 743 + 579 + 877. Keep your columns straight. Add *down*. How many tens do you carry to the tens column? How many hundreds do you carry to the hundreds column? How many thousands are there in your answer? Check by adding *up*.

	a	*b*	*c*	*d*	e	*f*
4.	57	13	99	47	54	89
	49	61	73	64	54	62
	23	26	35	86	79	75
5.	39	28	9	6	47	25
	95	7	65	24	70	18
	95	63	48	5	89	98
6.	378	509	837	355	696	639
	746	948	789	808	805	772
7.	472	698	812	359	314	239
	283	630	419	563	689	757
	525	653	493	204	103	868
8.	395	462	109	567	681	764
	186	608	420	389	72	306
	452	457	795	495	449	659
9.	308	76	584	568	412	36
	65	497	866	76	87	9
	245	280	520	79	558	298
10.	276	429	138	877	739	239
	197	969	375	369	924	976
	358	617	985	548	799	688
	230	786	476	631	964	898
11.	363	155	912	64	159	269
	167	34	104	245	76	579
	696	301	89	8	740	685
	58	267	646	26	82	969

Do You Understand Borrowing?

tens	ones
3	1
1	2
1	9

1. Jill has 31 roses to sell. She put 10 roses in each bundle and had 1 extra rose. She sold 12 roses.

Think of the roses as *tens* and *ones*. Change one 10 bunch into ones, making 10 + 1 or 11 ones. Now take 2 roses from the 11, leaving 9 in the ones vase. Take one ten from the 2 tens which were left. How many roses did Jill have left?

2. Don is helping to sell vegetables at his father's roadside stand. He had 40 ears of corn to sell. A customer bought 18 ears. To find how many ears were left, arrange 40 pieces of chalk in groups of 10's. Change 1 ten group to 10 ones. Then take 8 ones from the 10 ones. Next take 1 ten from the 3 tens. How many ten groups and how many ones (single pieces of chalk) were left?

4	0
1	8
2	2

3. Bill had 26 cents (2 dimes and 6 pennies). He spent 19 cents for some marbles. How much money did he have left? (First change a dime to pennies. $10¢ + 6¢ = 16¢$. Then show how to take $19¢$ away from 1 dime and $16¢$.)

4. Our club wanted to sell 62 tickets for the school play. After we had sold 39 tickets, how many tickets did we still have to sell?

$$\begin{array}{r} 62 \\ 39 \\ \hline 23 \end{array}$$

Start your subtraction in the ones column. Since you cannot subtract 9 from 2, you must borrow 1 ten from the 6 tens. 10 ones + 2 ones = 12 ones. Subtract 9 from 12. Then subtract 3 tens from 5 tens.

How many tickets did our club have left to sell?

You can check your work by adding the number of tickets left to the number of tickets sold. The sum should be 62, the number of tickets we want to sell in all. Cover the 62 when you add 23 and 39.

Copy and subtract. Check each answer by adding. If your sum is not the number you started with, find your mistake.

	a	*b*	*c*	*d*	*e*	*f*
5.	43 16	63 24	50 43	42 26	63 35	38 29
6.	392 164	573 246	895 627	362 143	730 318	957 236
7.	718 653	827 562	326 283	948 456	629 257	847 294
8.	941 467	725 236	823 347	916 239	620 268	536 178
9.	324 289	559 482	467 78	644 477	721 533	333 146
10.	237 149	650 486	976 817	515 439	723 535	861 372
11.	140 64	706 377	915 339	592 287	314 78	801 565

Measuring Time

Do you remember the facts about the units used for measuring time?

1. How many seconds are there in a minute?

2. How many minutes make an hour?

3. How many hours are there in a day?

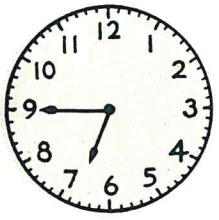
4. How many months in a year? How many days?

5. The unit of time you use to measure the time it takes to bake a cake is the minute. What unit of time would you use to measure your age?

6. What unit of time would you use to measure how long you work for pay?

7. What unit would you use to tell how long it takes to run a short race?

8. What unit might you use to measure the length of your summer vacation?



9. The clock at the left shows when Jean's favorite television program starts. In what two ways can you say the time it starts?

10. Sue is baking muffins. She put them in the oven at 7: 25. It takes muffins about 18 minutes to bake. When will Sue's muffins be done?

11. Bill's school lasts from 9 o'clock in the morning to 12 o'clock at noon, and from 1 o'clock in the afternoon to 3 o'clock. How many hours is Bill in school each day?

12. Tom kept a record of the weather in October. There were only 9 clear days. How many days in October were not clear?

13. Last year, Nora's father gave her a book every two months. How many books did he give her during the year?

14. Jim's brother works from 9 a. m. to 5 p. m. He has an hour out for lunch. How many hours a day does he work?

15. Jean earns 5 cents a day for helping with the dishes. How much does she earn in a week?

16. It is 18 days to Bill's birthday. How many weeks is this? How many days left over?

17. Yesterday Nancy practiced her piano lesson from 20 minutes after 4 o'clock to 10 minutes of 5. How many minutes did she practice?

18. Last summer, Ann spent 4 weeks in the country. How many days was she there?

19. Ann's father works 8 hours a day, five days a week. How many hours a week does he work?

20. Jerry goes to bed at 9: 30 in the evening. He gets up at 7: 30 in the morning. How many hours' sleep does he get?

21. Bob can walk a mile in 20 minutes. At this rate, how long would it take him to walk three miles?

22. Jean's mother is roasting a four-pound chicken. It should stay in the oven about 30 minutes for each pound. How many minutes should Jean's mother cook the chicken?

23. Tom visits the dentist to have his teeth cleaned and checked every six months. How many times a year is this?

24. The clock in Sue's kitchen reads 5: 02, but it is 3 minutes fast. What is the correct time?

25. Last year, our Christmas vacation was one week and 5 days long. How many days of vacation did we have?

Pages 254 and 255 provide enrichment material which can be used after this page.

Can You Add Money Numbers?

\$3.87
1.95
.75
\$6.57

1. Dick had saved \$3.87 for a tool chest. Then he earned \$1.95 by making and selling a bookcase, and 75 cents by making and selling a birdhouse. To find how much money he had then, add \$3.87, \$1.95, and \$.75.

First, add the cents column *down*. How many dimes do you carry to the dimes column? Add the dimes column *down*. How many dollars do you carry to the dollars column? How much money did Dick have?

How do you check your work?

Copy these examples, add, and check. Keep your columns straight. Be sure to write the dollar sign and the point in each answer. Where do you always write the point?

	a	*b*	*c*	*d*	e
2.	\$2.58 6.49	\$6.47 6.78	\$8.50 7.95	\$8.06 5.98	\$12.37 9.79
3.	\$3.69 4.17 1.45	\$4.39 8.24 6.23	\$5.32 6.47 2.98	\$4.95 .68 3.09	\$4.62 .46 2.37
4.	\$4.82 .29 6.51	\$5.47 4.36 8.15	\$ .98 3.50 7.87	\$2.10 9.05 4.66	\$7.11 4.14 5.08
5.	\$8.24 1.62 .41	\$2.69 1.98 8.35	\$17.78 8.90 9.86	\$ 9.87 46.08 5.68	\$37.17 4.66 25.69
6.	\$4.17 3.60 5.90 2.48	\$5.49 7.91 9.88 8.68	\$2.99 7.79 7.26 5.46	\$15.52 24.75 9.16 30.57	\$ 1.49 54.75 9.55 85.13

Can You Subtract Money Numbers?

1. Jean had five dollars. She spent $1.25 for some drawing materials. To find how much she had left, subtract $1.25 from $5.00.

$$\begin{array}{r} \$5.00 \\ 1.25 \\ \hline \$3.75 \end{array}$$

First, subtract the cents. You cannot subtract 5 cents from 0 cents. You cannot borrow a dime because there are no dimes to borrow from. So you take a dollar from the 5 dollars and change it into 10 dimes. Then borrow one of the dimes and change it into 10 cents. Now subtract 5 cents from 10 cents.

Next, you subtract 2 dimes from the 9 dimes left. Last, you subtract 1 dollar from the 4 dollars left.

How much money did Jean have left?

Check your work by adding how much money Jean had left to how much she spent. Is the sum $5.00?

Copy, subtract, and check.

	a	*b*	*c*	*d*	e
2.	$\begin{array}{r} \$7.65 \\ 5.20 \\ \hline \end{array}$	$\begin{array}{r} \$4.27 \\ 3.15 \\ \hline \end{array}$	$\begin{array}{r} \$5.83 \\ 1.65 \\ \hline \end{array}$	$\begin{array}{r} \$6.70 \\ 5.56 \\ \hline \end{array}$	$\begin{array}{r} \$8.62 \\ 3.47 \\ \hline \end{array}$
3.	$\begin{array}{r} \$4.09 \\ 2.38 \\ \hline \end{array}$	$\begin{array}{r} \$5.27 \\ 1.43 \\ \hline \end{array}$	$\begin{array}{r} \$9.21 \\ 3.87 \\ \hline \end{array}$	$\begin{array}{r} \$2.00 \\ .42 \\ \hline \end{array}$	$\begin{array}{r} \$8.16 \\ .85 \\ \hline \end{array}$
4.	$\begin{array}{r} \$6.24 \\ .43 \\ \hline \end{array}$	$\begin{array}{r} \$4.51 \\ 3.39 \\ \hline \end{array}$	$\begin{array}{r} \$1.15 \\ .65 \\ \hline \end{array}$	$\begin{array}{r} \$1.00 \\ .51 \\ \hline \end{array}$	$\begin{array}{r} \$8.45 \\ 7.79 \\ \hline \end{array}$
5.	$\begin{array}{r} \$9.04 \\ 6.37 \\ \hline \end{array}$	$\begin{array}{r} \$2.10 \\ .71 \\ \hline \end{array}$	$\begin{array}{r} \$8.66 \\ 7.59 \\ \hline \end{array}$	$\begin{array}{r} \$10.50 \\ 8.60 \\ \hline \end{array}$	$\begin{array}{r} \$13.76 \\ 9.08 \\ \hline \end{array}$
6.	$\begin{array}{r} \$12.61 \\ 7.56 \\ \hline \end{array}$	$\begin{array}{r} \$14.79 \\ 2.89 \\ \hline \end{array}$	$\begin{array}{r} \$25.88 \\ 2.97 \\ \hline \end{array}$	$\begin{array}{r} \$14.47 \\ 3.69 \\ \hline \end{array}$	$\begin{array}{r} \$25.00 \\ 10.38 \\ \hline \end{array}$
7.	$\begin{array}{r} \$12.33 \\ 11.67 \\ \hline \end{array}$	$\begin{array}{r} \$14.01 \\ 10.72 \\ \hline \end{array}$	$\begin{array}{r} \$32.36 \\ 22.49 \\ \hline \end{array}$	$\begin{array}{r} \$18.24 \\ 17.32 \\ \hline \end{array}$	$\begin{array}{r} \$43.40 \\ 25.56 \\ \hline \end{array}$

Can You Count Money?

See if you can tell how much money each group of coins is worth without using your pencil.

1. Three pennies, a nickel, and a dime.
2. Two pennies, 2 nickels, and a dime.
3. Three pennies and 3 nickels.
4. One penny and 2 dimes.
5. A nickel and a quarter.
6. Two dimes and a quarter.
7. Two pennies, a nickel, a dime, and a half dollar.
8. A nickel, a dime, and 2 quarters.

How Much Change?

1. Sally bought groceries costing 52 cents. She gave the clerk a dollar bill. The clerk counted her change: "Fifty-two cents and 3 cents is 55 cents; and 20 cents is 75 cents; and 25 cents is one dollar." What coins did the clerk give Sally? How many cents were they worth?

Subtract 52¢ from $1 to see if Sally got the right change.

2. How much change should you get from a half dollar for a purchase of 18 cents? What is the smallest number of coins you could get in change? Count out this change.

3. Count out the change Bill should get from a purchase of $1.09 if he gives the clerk $2.00. How much change should he get? How many coins?

4. Don's family has a road stand. One day a man bought a basket of apples for 87 cents. If he gave Don a five-dollar bill, what change should Don have given him?

Pages 256 and 257 provide enrichment material which can be used after this page.

Which Is More?

In each pair, tell which is larger.

	a	*b*
1.	A week or 10 days	55 minutes or an hour
2.	A day or 20 hours	5 weeks or a month
3.	A year or 15 months	45 seconds or a minute
4.	An hour or 40 minutes	15 hours or a day
5.	A year or 400 days	6 days or a week
6.	A minute or 70 seconds	10 months or a year

Tell which is worth more.

7. Two nickels and a dime or a quarter
8. Four pennies and a dime or 3 nickels
9. A dime or 3 nickels
10. A quarter or 3 dimes

Can You Copy Numbers?

Do you copy numbers so well that you can add or subtract them without making mistakes? Do you write figures so plainly that you know what each figure is? Do you keep your column straight so that you don't get over into the wrong column as you work?

Copy, add, and check.

	a	*b*
1.	98 + 37 + 246 + 9	1346 + 69 + 728 + 7
2.	$2.09 + $6.54 + $8.27	$5.00 + $.75 + $2.18
3.	$12.53 + $6.29 + $20	$1.57 + 48¢ + $3

Copy, subtract and check.

	a	*b*	*c*
4.	130 — 39	324 — 65	1709 — 826
5.	$1.75 — $.98	$16.02 — $7.05	$15.00 — $3.57
6.	$5 — $4.28	$18 —$3.40	$4 — 83¢

Do You Add or Subtract?

1. Jerry has saved $3 to buy stamps for his album. In a magazine, he sees a packet of stamps advertised for $1.65. If he buys the packet, how much money will he have left?

This problem tells you how much money Jerry has and how much he wants to spend. It asks you to find *how much he will have left* if he spends the money. To find how much will be left, you must *subtract.*

Subtract $1.65 from $3. How much money will Jerry have left?

2. Ellen spent $2.65 for ice cream for her party and 85 cents for cake. How much did she spend for refreshments for her party?

This problem tells you how much Ellen spent for each of two different things. It asks you to find *how much the things cost together.* To find the *total cost* of different things, you must *add.*

Add $2.65 and 85 cents. How much did Ellen spend for the ice cream and cake together?

Decide whether you add or subtract in each problem. On your paper, write A if you add or S if you subtract. Then find the answers and write them on your paper.

3. Last summer, the Lanes took a trip in their car. The first week, they drove 948 miles. The second week, they drove 1208 miles. How many miles did they drive in both weeks?

4. We have started to take a trip of 420 miles. So far, we have gone 86 miles. How many more miles do we still have to go?

5. After spending $3.69 for some roller skates, Peggy counted the money left in her purse. It was $1.18. How much must she have had before she bought the skates?

6. Ellen bought $2.65 worth of ice cream for her party. She gave the storekeeper $5. How much change did Ellen get?

7. Nancy practiced 15 minutes before school yesterday morning and 25 minutes after school in the afternoon. How many minutes did she practice yesterday?

8. In Problem 7, how many minutes less than one hour did Nancy practice?

9. Jerry got 73 new stamps last month. His friend Larry was also in the stamp club. Larry got 59 new stamps. How many more stamps did Jerry get than Larry?

10. Sue made some candy and sold it for $1.50. The sugar and other materials cost 68 cents. How much money did Sue make by selling the candy?

11. Sam caught some fish and sold them for $2.50. He also sold some rabbits for $3.86. How much money did Sam get for both the fish and the rabbits?

Pages 258 and 259 provide enrichment material which can be used after this page.

Practice in Addition

These examples will help you keep up and improve your skills in addition. Copy the examples, add, and check.

Do you remember addition facts?

	a	*b*	*c*	*d*	e	*f*	*g*	*h*
1.	9 4	6 6	6 9	7 3	8 9	4 6	9 5	6 8
2.	3 9	8 6	7 5	6 7	4 8	5 5	8 8	7 4
3.	19 1	13 6	12 8	67 6	38 8	23 7	49 6	38 9

Can you carry in addition?

	a	*b*	*c*	*d*	e
4.	45 17	27 34	69 57	146 204	34 148
5.	263 184	478 332	854 877	580 950	3475 3948

Can you add columns?

6.	8 5 9 3 6	64 85 38 97 62	56 70 20 75 95	634 218 256 969	365 7422 78 2704

Can you add money numbers?

7.	$.57 .19	$.47 .58	$5.35 2.79	$8.79 6.70	$17.07 44.99
8.	$2.03 8.57 8.64 3.59	$1.74 8.96 3.07 .37	$3.68 6.11 .75 7.80	$6.49 35.54 2.09 59.67	$87.97 23.74 8.34 89.00

Practice in Subtraction

Work these examples to build up your subtraction skills. Copy the examples, subtract, and check.

Do you know these subtraction facts?

	a	b	c	d	e	f	g
1.	13 8	12 4	14 7	12 5	13 7	12 3	16 9
2.	14 5	15 8	25 7	22 8	18 5	23 6	37 9

Can you borrow in subtraction?

	a	b	c	d	e
3.	84 39	63 46	95 17	53 34	142 59
4.	143 64	164 97	123 48	132 76	188 97
5.	836 567	941 517	661 162	268 79	1622 267

Can you use zeros in subtraction?

6.	90 34	710 209	570 552	718 340	607 387
7.	504 226	413 409	700 483	680 607	1000 710

Can you subtract dollars and cents?

8.	$1.30 .89	$3.00 2.17	$12.81 5.86	$5.00 4.45	$10.00 3.03
9.	$12.77 9.99	$26.14 19.65	$30.00 25.98	$92.26 88.38	$65.00 60.65

Multiplying Helps You Divide

	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

This table shows how multiplication and division facts belong together. Find the colored 54. It shows that: $6 \times 9 = 54$, $9 \times 6 = 54$, $54 \div 6 = 9$, and $54 \div 9 = 6$.

Copy and finish these facts that belong together.

	a	*b*	*c*	*d*
1.	$5 \times 7 = ?$	$7 \times 5 = ?$	$35 \div 5 = ?$	$35 \div 7 = ?$
2.	$7 \times 8 = ?$	$? \times 7 = ?$	$56 \div 7 = ?$	$? \div 8 = ?$
3.	$9 \times 4 = ?$	$? \times 9 = ?$	$36 \div 4 = ?$	$36 \div ? = ?$
4.	$7 \times 6 = ?$	$? \times 7 = ?$	$42 \div ? = ?$	$42 \div ? = ?$
5.	$9 \times 8 = ?$	$? \times 9 = ?$	$72 \div ? = ?$	$? \div ? = ?$
6.	$7 \times 9 = ?$	$? \times ? = ?$	$63 \div ? = ?$	$? \div ? = ?$
7.	$8 \times 7 = ?$	$? \times ? = ?$	$? \div ? = ?$	$? \div ? = ?$
8.	$6 \times 9 = ?$	$? \times ? = ?$	$? \div ? = ?$	$? \div ? = ?$
9.	$9 \times 5 = ?$	$? \times ? = ?$	$? \div ? = ?$	$? \div ? = ?$

Do You Remember Multiplication?

Copy and multiply. Use the table on page 22 only if you have to. If you have forgotten any facts, learn them.

	a	b	c	d	e	f	g	h	i
1.	5 × 3	7 × 7	9 × 1	5 × 4	6 × 2	9 × 8	3 × 3	9 × 9	2 × 7
2.	3 × 8	4 × 4	5 × 2	3 × 9	4 × 8	4 × 5	7 × 9	7 × 3	2 × 9
3.	8 × 5	3 × 6	8 × 9	9 × 2	5 × 6	7 × 4	8 × 8	7 × 2	4 × 6
4.	1 × 8	3 × 7	5 × 9	3 × 4	9 × 5	8 × 3	6 × 5	6 × 6	8 × 2
5.	9 × 7	4 × 7	6 × 4	2 × 8	6 × 3	5 × 8	5 × 5	8 × 4	2 × 6

Do You Remember Division Facts?

Copy and write the quotients. Use the table if necessary.

	a	b	c	d	e	f
1.	$5\overline{)45}$	$3\overline{)18}$	$7\overline{)21}$	$6\overline{)30}$	$8\overline{)40}$	$4\overline{)12}$
2.	$4\overline{)20}$	$7\overline{)63}$	$2\overline{)12}$	$8\overline{)24}$	$5\overline{)10}$	$3\overline{)27}$
3.	$6\overline{)12}$	$3\overline{)15}$	$9\overline{)63}$	$5\overline{)40}$	$2\overline{)18}$	$7\overline{)14}$
4.	$2\overline{)8}$	$4\overline{)24}$	$8\overline{)32}$	$2\overline{)10}$	$9\overline{)18}$	$3\overline{)24}$
5.	$8\overline{)16}$	$7\overline{)7}$	$3\overline{)12}$	$6\overline{)18}$	$5\overline{)20}$	$7\overline{)28}$
6.	$2\overline{)14}$	$9\overline{)81}$	$5\overline{)30}$	$9\overline{)45}$	$6\overline{)36}$	$4\overline{)16}$
7.	$6\overline{)24}$	$3\overline{)9}$	$4\overline{)28}$	$7\overline{)49}$	$2\overline{)16}$	$5\overline{)15}$
8.	$8\overline{)64}$	$3\overline{)21}$	$9\overline{)27}$	$5\overline{)25}$	$8\overline{)8}$	$4\overline{)32}$

Multiplication and Division Quickies

Here are some more quickies. Can you find all the answers without using your pencil? In some of the problems, you use multiplication. In the other problems, you use division. Decide which process you should use in each problem before you give the answer.

1. Sue made a pan of chocolate drop cookies. There were 3 rows of cookies in the pan, with 6 cookies in each row. How many cookies did Sue make?

2. Jean bought 5 cents' worth of candy corn. She counted the number of grains and found she had bought 20 grains. How many grains did she get for a cent?

3. If peppermint drops are 2 for a cent, how many can Larry get for 10 cents?

4. Don has a strip of wood 40 inches long. He wants to cut it into 8-inch markers for his garden. How many markers will the 40-inch strip make?

5. Jill has picked 30 dahlias to sell at the stand. She sells them in bunches of 5. How many bunches does she have?

6. Tom's father brought 3 bricks of ice cream to the picnic. If each brick will serve 6 persons, how many persons will the 3 bricks serve?

7. Jill has 32 daffodil bulbs to plant. If she plants them in 4 equal rows, how many bulbs should she plant in each row?

8. If grapefruit cost 8 cents apiece, how much must Sally pay for 4 grapefruit?

9. Allen is putting some of his pictures in an album. If he puts 4 pictures on a page, how many pages will 28 pictures fill?

10. Sam is riding his bicycle to his cousin's house, 14 miles away. How many miles must Sam ride before he is halfway there?

11. Nora, Sally, and Sue are writing invitations for the party their class is giving. Each girl has agreed to write nine invitations. How many invitations will all three write?

12. Allen bought 3 rolls of film to use in taking pictures on a trip. He can take 8 pictures with each roll of film. How many pictures can he take?

13. Dave collects butterflies. He wants to mount some of his best butterflies on a large sheet of cardboard for the school hobby show. He can put 8 rows on the cardboard with 6 butterflies in each row. How many butterflies can he get on the cardboard?

14. Bob has 27 baby chicks and 3 hens to take care of them. He wants to give the same number of chicks to each hen. How many chicks should each hen get?

15. Tom and Joe are making popcorn balls to take on a picnic. They have 4 cans of popcorn to pop. If each can will make 5 popcorn balls, how many popcorn balls will they have for the picnic?

16. The driver of Jill's school bus told her he had used 9 gallons of gasoline in driving 72 miles. How many miles did he get per gallon?

17. Six cars have been promised to carry some boys from Bill's school to a baseball game. If each car can take 5 boys, how many boys can all 6 cars carry?

18. Sally paid 24 cents for half a dozen doughnuts. How much did each doughnut cost?

19. Tony brought 3 cards of old coins to the hobby show. Each card held 9 coins. How many coins did Tony bring?

Can You Use Multiplication Facts?

12 12 12 12 48	12 4 48

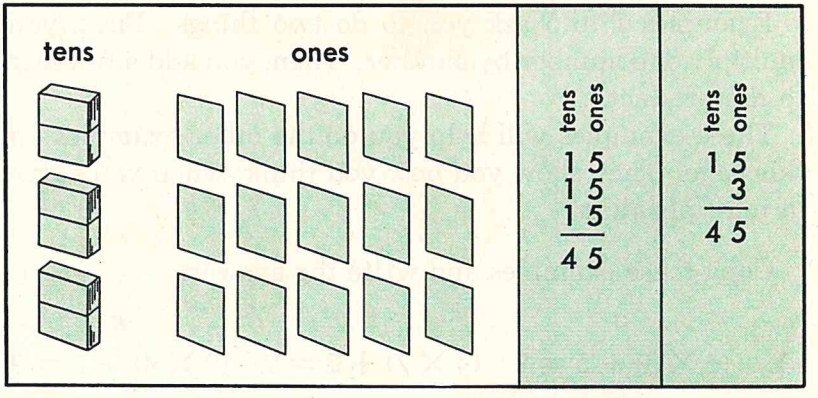
1. Bob has orders for 4 dozen eggs. To find how many eggs Bob needs to fill these orders, you can add four 12's. Or you can multiply 12 by 4. How many eggs are 4 dozen eggs?

Multiplication is a short way of adding equal numbers of things.

Copy and multiply.

	a	b	c	d	e	f
2.	14 2	32 3	21 4	20 4	43 2	30 2
3.	70 9	43 3	61 8	82 2	94 2	80 7
4.	51 6	71 5	31 7	60 4	51 8	21 7
5.	42 4	21 9	81 6	52 4	60 7	90 8

Carrying in Multiplication



1. Three boys are selling tickets for the school carnival. Each boy has 15 tickets to sell. To find how many tickets all 3 boys have, you can put all the tickets together and count them, or you can add three 15's, or you can multiply 15 by 3.

When you add the three 5's, how many tens do you carry? When you multiply the 5 by the 3, how many tens do you carry?

How many tickets did the boys sell in all?

Copy and multiply. Check by going over your work.

	a	*b*	*c*	*d*	*e*	*f*
2.	17 3	25 2	13 4	27 4	36 3	47 2
3.	25 6	56 9	84 5	82 8	78 4	59 7
4.	47 5	85 4	99 9	34 7	62 5	15 9
5.	19 4	25 3	43 6	26 7	89 3	96 5

Practice in Multiplication

Examples 1 to 5 ask you to do two things. First, you multiply one number by another. Then, you add a number to the product.

These examples will help you do the other examples on this page. They show you how you think, when you carry in multiplication.

Copy these examples and write the answers.

	a	*b*	*c*
1.	$(6 \times 3) + 5 = ?$	$(4 \times 7) + 3 = ?$	$(9 \times 4) + 7 = ?$
2.	$(6 \times 8) + 4 = ?$	$(2 \times 9) + 1 = ?$	$(5 \times 6) + 3 =$
3.	$(8 \times 3) + 2 = ?$	$(9 \times 9) + 7 = ?$	$(6 \times 7) + 5 = ?$
4.	$(7 \times 7) + 4 = ?$	$(4 \times 5) + 3 = ?$	$(9 \times 8) + 7 = ?$
5.	$(8 \times 9) + 6 = ?$	$(9 \times 7) + 3 = ?$	$(7 \times 8) + 6 = ?$

Copy, multiply, and check.

	a	*b*	*c*	*d*	e
6.	24 × 3	68 × 4	85 × 8	59 × 5	72 × 6
7.	95 × 7	46 × 4	42 × 8	68 × 2	27 × 9
8.	16 × 8	68 × 9	64 × 8	97 × 8	17 × 7
9.	318 × 3	634 × 4	569 × 6	352 × 9	458 × 6
10.	602 × 7	750 × 8	358 × 5	835 × 9	376 × 7
11.	732 × 5	386 × 6	420 × 7	304 × 9	1080 × 5

Can You Multiply Money Numbers?

1. There is a golf course near Bill's house. Bill often finds golf balls which have been lost by players there. He can sell the good ones for 75 cents apiece. To find how much Bill will get for 4 golf balls, multiply $.75 by 4.

$ .75 4 $3.00

The work is shown in the box. Do you see how the dollar sign and the point are written in the answer? How many places are left for cents?

How much will Bill get for the 4 golf balls?

Copy these examples, multiply, and check. Don't forget the dollar sign and point in your answers.

	a	*b*	*c*	*d*	e
2.	$ .75 7	$ .34 5	$ .79 9	$ .92 6	$ .39 8
3.	$ .84 4	$ .60 6	$ .97 7	$ .68 9	$ .45 6
4.	$4.08 7	$5.16 9	$1.87 6	$7.54 8	$4.20 9
5.	$3.79 4	$8.75 2	$1.68 7	$3.89 6	$9.75 9
6.	$6.29 3	$9.78 5	$6.95 4	$8.46 8	$13.09 2
7.	$12.50 4	$26.94 2	$14.78 3	$26.89 8	$20.80 5
8.	$30.95 3	$48.33 9	$15.07 8	$16.75 5	$63.92 7

Pages 260 and 261 provide enrichment material which can be used after this page.

Can You Divide With a Remainder?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

In this table, the colored numbers can be divided by 6 without a remainder. The table will help you divide by 6 with a remainder.

$$\begin{array}{r} 8 \\ 6\overline{)50} \\ 48 \\ \hline 2 \end{array}$$

1. Don had 50 tomato plants that he wanted to set out in 6 equal rows. To find how many he put in each row, divide 50 by 6.

Look at 50 in the table. You can see that there are eight 6's (48) in 50, with 2 left over. Don could put ? plants in each row with ? plants left over.

Copy these examples and divide.

	a	b	c	d	e	f
2.	$6\overline{)16}$	$6\overline{)53}$	$6\overline{)26}$	$6\overline{)58}$	$6\overline{)20}$	$6\overline{)40}$
3.	$6\overline{)35}$	$6\overline{)46}$	$6\overline{)56}$	$6\overline{)41}$	$6\overline{)32}$	$6\overline{)43}$
4.	$2\overline{)17}$	$3\overline{)10}$	$2\overline{)19}$	$4\overline{)21}$	$3\overline{)20}$	$4\overline{)30}$
5.	$5\overline{)34}$	$4\overline{)38}$	$3\overline{)25}$	$6\overline{)27}$	$5\overline{)43}$	$7\overline{)16}$
6.	$7\overline{)30}$	$4\overline{)33}$	$9\overline{)29}$	$8\overline{)44}$	$7\overline{)48}$	$5\overline{)49}$
7.	$8\overline{)30}$	$9\overline{)68}$	$3\overline{)29}$	$8\overline{)52}$	$8\overline{)70}$	$7\overline{)40}$
8.	$9\overline{)50}$	$5\overline{)38}$	$8\overline{)62}$	$7\overline{)66}$	$9\overline{)59}$	$4\overline{)27}$

Finding Two-Figure Quotients

1. Sally has 120 big beads. She wants to use them to make 8 necklaces for presents. There are to be the same number of beads in each necklace. To find how many beads Sally should put in each necklace, divide 120 by 8.

(1) You cannot divide 8 into 1; so you must divide 8 into 12 tens. $12 \div 8 = 1$. Write 1 above the 2 in the tens place.

(2) Multiply $8 \times 1 = 8$. Write 8 under the 12 tens.

(3) Subtract. $12 - 8 = 4$ tens.

(4) Bring down the 0 in the ones place. Do you see how to finish the division?

How many beads should Sally put in each necklace?

hundreds	tens	ones
	1	5
8	1	2 0
	8	
	4	0
	4	0

Copy and divide.

	a	b	c	d	e
2.	$4\overline{)268}$	$6\overline{)474}$	$8\overline{)784}$	$9\overline{)531}$	$7\overline{)364}$
3.	$5\overline{)455}$	$9\overline{)414}$	$7\overline{)588}$	$8\overline{)576}$	$6\overline{)390}$
4.	$8\overline{)504}$	$5\overline{)290}$	$9\overline{)783}$	$6\overline{)228}$	$7\overline{)672}$

Can You Check Division?

13 r 2 6)80 6 20 18 2	Check 13 6 78 2 80

1. Sue has made 80 doughnuts. She wants to pack them in boxes, with 6 in each box. To find how many boxes she will need, she divides 80 by 6. The quotient is 13, with a remainder of 2.

To make sure she is right, Sue multiplies 13 (the number of boxes) by 6 (the number of doughnuts in each box) and adds 2 (the number of doughnuts left over). Was her division right?

2. Divide 547 by 9. Do you see why a zero is written in the ones place, over the 7? The quotient is 60, with a remainder of 7.

How would you check this answer?

60 r 7 9)547 54 7

3. Divide 4249 by 7. You don't have to bring any numbers down in this example. Check the answer.

607 7)4249

Copy, divide, and check.

	a	b	c	d	e
4.	6)546	7)427	5)400	4)828	3)918
5.	6)3048	8)3240	3)2724	5)85	8)96
6.	2)76	5)245	8)536	7)175	9)351
7.	8)304	7)686	9)603	6)456	5)280
8.	4)274	3)172	7)307	6)148	2)195
9.	9)766	4)217	7)492	9)365	8)727
10.	3)149	6)185	9)252	7)634	5)187

Thinking About Number Facts

1. What other addition fact belongs with $7 + 9 = 16$?

2. What other subtraction fact goes with $13 - 9 = 4$?

3. What two subtraction facts belong with $6 + 8 = 14$?

4. Write four addition and subtraction facts using the numbers 5, 9, and 14.

5. What other multiplication fact goes with $6 \times 9 = 54$?

6. What other division fact goes with $72 \div 8 = 9$?

7. Write two multiplication facts with 5, 4, and 20.

8. What two division facts belong with $7 \times 6 = 42$?

9. Write four multiplication and division facts with the numbers 6, 8, and 48.

In the following examples, give each sum. Then give a subtraction fact that belongs with it. So, for Example 10a, $7 + 8 = 15$, and $15 - 7 = 8$.

	a	*b*	*c*	*d*	e
10.	7	+ 8	+ 3	+ 7	+ 6	+ 4
11.	6	+ 4	+ 9	+ 5	+ 7	+ 6
12.	9	+ 3	+ 8	+ 4	+ 6	+ 9
13.	8	+ 5	+ 9	+ 7	+ 8	+ 4

In these examples, give each product and a division fact.

14.	8	× 4	× 8	× 7	× 9	× 5
15.	6	× 5	× 9	× 6	× 3	× 4
16.	7	× 7	× 5	× 9	× 8	× 3
17.	9	× 4	× 9	× 8	× 6	× 7

Measuring Length

Do you remember the facts about the units that are used for measuring length?

1. How many inches are there in a foot?

2. How many feet make a yard? How many inches is this?

3. How many feet are there in the 100-yard dash?

4. Which of these units of length (inch, foot, yard) would you use to measure a snapshot? A kite string?

5. What unit would you use to measure the length of a piece of cloth? The width of a piece of ribbon? The length of a short race?

6. What two units might you use in measuring your height?

7. What units might you use to measure the length of your classroom?

8. Jim is exactly 5 feet tall. How many inches tall is he? Linda is 56 inches tall. Who is taller, Linda or Jim? How much taller?

9. Larry is 4 feet 9 inches tall. How many inches is this?

10. Sue is 4 feet 10 inches tall and Jill is 59 inches tall. Which girl is taller? How much taller?

11. A year ago Bill's height was 4 ft. 8 in. Now Bill is 5 feet tall. How many inches has he grown in a year?

12. Ann had a piece of ribbon a yard long. She cut off a piece 18 inches long to make a bow. How many inches of ribbon did she have left?

13. Sally measured a piece of cloth with a yardstick. The piece was 1 yard and 16 inches long. How many inches of cloth did she have?

14. The swimming pool in Bill's school is 36 yards long. How many feet long is it? The pool is 10 yards wide. How many feet wide is it?

15. Bob Gray and his father measured their kitchen for new linoleum. The floor was 5 yd. 1 ft. long, and 4 yd. wide. How many feet long is this? How many feet wide?

16. The length and width of a room are called its dimensions. Ann's bedroom is 4 yd. 2 ft. long and 3 yd. 1 ft. wide. What are its dimensions in feet?

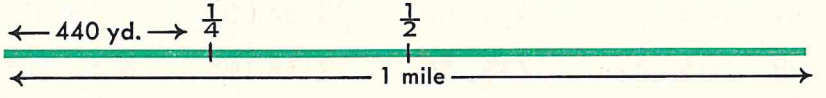
How Long Is a Mile?

If you walk right along without stopping, you can walk about a mile in 15 minutes.

1. Name a place that is about 1 mile from your school.

2. In Lydia's town, 12 blocks make one mile. Lydia lives 4 blocks from school. What part of a mile is this?

3. Bill and Jerry hiked to Silver Lake. They hiked for 25 minutes, rested, and reached the lake in 20 minutes more. About how far did they hike to Silver Lake?



4. Bill and his father were watching a track meet on TV. One of the races was the 440-yard run. This was a quarter-mile race. How many yards would the half-mile race be? How many yards are there in a mile?

5. How many feet are there in 1 mile? About how many miles high is a 10,000 foot mountain?

1 mile = 1760 yards = 5,280 feet

Pages 262 and 263 provide enrichment material which can be used after this page.

Can You Divide Money Numbers?

	dollars	dimes	cents
	$	. 3	5
6)	$ 2	. 1	0
	1	8	
		3	0
		3	0

Check

$ .35
6
$2.10

1. Bob sold a 6-pound chicken for $2.10. To find how much a pound he got for the chicken, divide $2.10 by 6.

You cannot divide the 2 in the dollars place by 6, so you must divide 21 dimes by 6. The division is finished in the box at the left. The point in the quotient is placed above the point in the number you divide.

How much a pound did Bob get?

To check, multiply the price per pound by 6, the number of pounds. Is the product the price of the chicken?

2. Divide $28.35 by 7. In this example you don't have to bring down any numbers. What is the quotient? Check this answer.

$ 4.05
7)$28.35

3. On your paper, divide $23.00 by 5. Why must you write a zero in the cents place of the quotient? Check the answer.

Copy these examples, divide, and check.

	a	*b*	*c*	*d*
4.	3)$6.90	5)$2.00	8)$4.80	7)$6.30
5.	3)$2.43	7)$ .56	9)$8.19	6)$ .54
6.	4)$ .64	3)$2.25	5)$1.45	6)$2.88
7.	7)$4.69	8)$6.00	4)$3.12	7)$3.15
8.	9)$4.23	6)$4.38	5)$2.85	9)$3.24
9.	4)$10.00	8)$14.40	5)$15.40	7)$9.24
10.	6)$9.90	2)$12.18	2)$15.00	8)$25.52
11.	9)$25.20	5)$30.20	8)$34.00	6)$17.40

Do You Know Roman Numbers?

1. Draw a clock face, using Roman numbers instead of our numbers. What time is it when the hour hand points to XI and the minute hand points to XII?

2. What time is it when the minute hand points to IX and the hour hand points between VII and VIII?

3. Chapter XIX is the last chapter in the book Nora is reading. How many chapters does the book have?

4. What chapter comes just after Chapter VIII?

5. Write the Roman numbers from XIII to XXXIX. What Roman number comes just after XIII?

6. What Roman number comes just before XXX?

7. What Roman number comes between XXIV and XXVI?

8. Is XXVIII larger or smaller than XXXI?

9. Which of these numbers is larger, XIX or XVIII?

10. Which of these numbers is smaller, XXXI or XXII?

11. Which is the largest, XXVI or XXIV or XXX?

12. Which is smallest, XXXVII or XXXIII or XXXV?

13. What Roman number is 3 more than IX?

14. What Roman number is 5 less than XV?

15. What Roman number is $\frac{1}{3}$ of XXIV?

16. What Roman number is 4 times VIII?

17. In Roman numbers, what is the sum of VI and IX?

18. Subtract to find the difference between XIII and IV. Write your answer in Roman numbers.

19. In Roman numbers, what is the product of VII times III?

20. What is the quotient of XII divided by IV?

Do You Multiply or Divide?

1. Don wants to set out 54 lettuce plants in 3 equal rows. How many plants should he put in each row?

How many plants are there in all? How many groups (rows) are the plants to be put in?

The problem asks you to find *the number* of plants *in each group* (row). When you know the total number and how many groups there are, you *divide* to find the number in each group.

Find how many plants Don should put in each row.

2. If Nora reads 16 pages of her book in an hour, about how many pages can she read in 4 hours?

This problem tells you how many pages Nora reads in *one* hour. It asks you to find *the total number* of pages she can read in 4 hours. When you know how many groups (hours) and how many things (pages) in each group, you *multiply* to find the total number.

Find how many pages Nora should be able to read in 4 hours.

Number your paper 3 to 13. After each number, write M if you multiply in that problem or D if you divide. Then find the answer and write it after the letter. See whether you can work any of the problems as quickies.

3. If oranges cost 5 cents each, how much must Sally pay for a dozen oranges?

4. There are 26 boys and girls in Tom's class. Miss Lane has asked Tom to give each pupil 3 pieces of paper. How many pieces of paper does Tom need?

5. Jill has picked 40 roses. If she puts 6 roses in each bunch, how many full bunches will she have? How many roses will be left over?

6. Ann has 75 cents to spend for apples for a picnic. If apples are 5 cents each, how many can Ann buy?

7. Ann's mother sees some blouses for Ann priced at $1.15 each. How much will three blouses cost?

8. Nora read 282 words in 3 minutes. How many words a minute did she read, on the average?

9. Sam sold 42 glasses of lemonade for 6¢ a glass. How much money did he get?

10. Jerry bought a set of 3 stamps for 45 cents. How much did each stamp cost, on the average?

11. Sam and Bob have to put 72 chairs in equal rows for the class play. If they put 8 chairs in each row, how many rows will there be?

12. Jean wants to buy six tubes of water colors. They cost 24 cents a tube. How much will the tubes of paint cost her?

13. If Jean buys 4 sheets of drawing paper and the clerk charges her 60 cents, how much a sheet did the paper cost?

Pages 264 and 265 provide enrichment material which can be used after this page.

Can You Use Zeros?

Are you sure what to do when you add, subtract, multiply, and divide with zeros? Copy and finish these examples.

	a	*b*	*c*	*d*
1.	$9+0=?$	$0+7=?$	$0+0=?$	$10+4=?$
2.	$8-0=?$	$0-0=?$	$10-1=?$	$3-3=?$
3.	$0\times5=?$	$0\times0=?$	$6\times0=?$	$0\div2=?$

Copy, add, and check.

	a	*b*	*c*	*d*	e
4.	80 74	69 90	30 80	308 702	4009 6001
5.	137 300 85 208	530 490 617 1009	\$.08 .94 .90 .08	\$5.59 3.09 21.80 9.58	\$148.48 245.00 90.50 416.82

Copy, subtract, and check.

6.	90 20	60 16	100 17	159 70	506 342
7.	103 29	801 705	900 358	\$10.00 4.90	\$20.01 18.08

Copy, multiply, and check.

8.	40 2	80 5	45 6	28 5	305 4
9.	609 6	740 5	500 8	\$3.50 6	\$10.07 9

Copy, divide, and check.

10.	$2\overline{)80}$	$8\overline{)400}$	$4\overline{)836}$	$6\overline{)485}$	$3\overline{)902}$

Putting Numbers in Problems

Finish these problems by filling in the missing numbers. Pick numbers that are reasonable, then find the answers. Write your numbers and answers on your paper. Be ready to tell which process you used to find each answer. See whether you can solve any problems as quickies.

1. Ann's mother bought her a pair of shoes costing ?. She handed the clerk a ? dollar bill. How much change did the clerk give her?

2. Sam can ride his bicycle ? miles an hour. How many hours will it take him to ride ? miles?

3. Jean is ? inches tall. Her mother is ? inches tall. How much taller than Jean is her mother?

4. Andy charges ? cents an hour for cutting lawns. One day it took him ? hours to cut Mrs. Town's lawn. How much should Mrs. Town pay him?

5. Peggy bought a sweater costing ? and a pair of roller skates costing ?. What was the total cost?

6. If I can walk ? miles an hour, how many miles can I walk in ? hours?

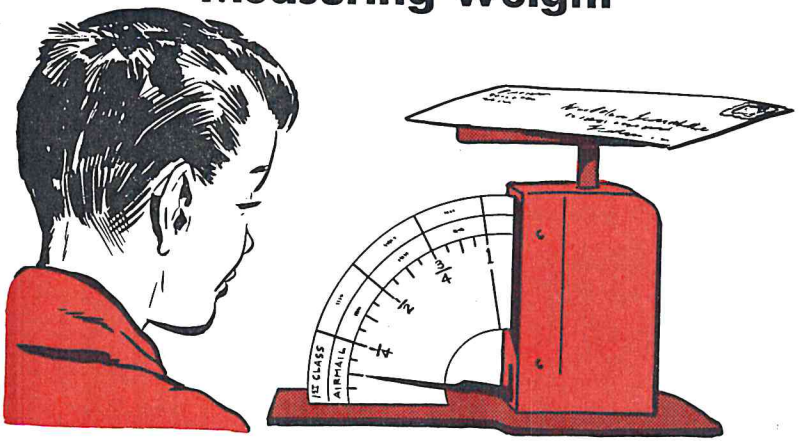
7. Sally paid ? cents for ? cupcakes. How much was this for each cupcake?

8. A year ago Bill weighed ? pounds. Now he weighs ? pounds. How many pounds has he gained in a year?

9. Don sold two watermelons. One weighed ? pounds and the other weighed ? pounds. How much did both weigh?

10. Don and Sue are saving money to buy a table radio costing ?. If they save ? a week, how many weeks will it take them to save enough to buy the radio?

Measuring Weight



1. Tom is weighing a letter on some letter scales. The scales show one pound (1 lb.) divided into ounces (oz.) How many ounces does Tom's letter weigh?

2. How many ounces do the scales show there are in a pound? How many ounces are there in a half pound? In $\frac{1}{4}$ pound? In $\frac{1}{8}$ lb.? In $\frac{3}{4}$ lb.?

3. What fraction of a pound is 8 ounces? If a pound of chocolate-covered peppermints costs 80 cents, how much should 8 ounces of this candy cost?

4. If 8 oz. of bacon cost 35 cents, how much will Sally have to pay for a pound of this kind of bacon?

5. At the store, Sally saw some dried beef which cost 35 cents for 4 oz. How much a pound would this be?

6. Ann bought a chocolate candy bar weighing 4 ounces. She paid 18 cents for it. How many 4-ounce bars are there in a pound? Then how much a pound was Ann paying for her candy?

7. If a 2-ounce candy bar costs 10 cents, how much is this a pound?

8. Mrs. Lane paid 38 cents for 8 oz. of cheese. At this rate, how much would a pound of this cheese be worth? Mrs. Lane could get a pound of the cheese for 75 cents. How much would she save by buying a pound at a time?

9. Sam and Bob went fishing for trout. The largest trout that Sam caught weighed 1 pound. Bob's largest fish weighed only 13 ounces. How many ounces more did Sam's fish weigh?

10. Sue's mother bought a beef roast weighing 4 lb. 10 oz. How many ounces less than 5 pounds of meat did she buy?

11. Jill ordered by mail articles that weighed 2 oz., 5 oz., 6 oz., and 8 oz. How many ounces was this? How much more than one pound did all these articles weigh?

One ton equals 2000 pounds.

12. When Tony went to the zoo, he saw an elephant that weighed 3950 lb. How many pounds more than a ton did the elephant weigh?

13. Don helped his father load 1600 lb. of lime on their truck. How much less than a ton is 1600 lb.?

14. If a jeep trailer can carry $\frac{1}{2}$ ton, how many pounds can it carry?

15. Don's father said that one of their cows weighed 987 lb. How many pounds less than half a ton was this?

16. Don and his father put 9 bags of fertilizer on their truck. Each bag weighed 100 lb. How much less than $\frac{1}{2}$ ton did all the fertilizer weigh?

17. If a coal truck can carry 4 tons of coal, how many pounds can it carry?

18. What unit of measure would you use to measure (a) your own weight? (b) A letter? (c) Coal?

Pages 266 and 267 provide enrichment material which can be used after this page.

Practicing Division

Copy and divide. Check each answer by multiplying.

		a	b	c
206 $4\overline{)824}$	1.	$7\overline{)287}$	$6\overline{)120}$	$9\overline{)639}$
	2.	$3\overline{)921}$	$4\overline{)1632}$	$6\overline{)2436}$
15 $6\overline{)90}$ 6 30 30	3.	$3\overline{)87}$	$2\overline{)74}$	$5\overline{)80}$
	4.	$7\overline{)511}$	$5\overline{)245}$	$8\overline{)272}$
	5.	$9\overline{)612}$	$6\overline{)582}$	$4\overline{)232}$
	6.	$8\overline{)552}$	$7\overline{)525}$	$9\overline{)657}$
237 $4\overline{)948}$ 8 14 12 28 28	7.	$2\overline{)396}$	$4\overline{)628}$	$3\overline{)855}$
	8.	$6\overline{)882}$	$8\overline{)984}$	$7\overline{)840}$
	9.	$5\overline{)2360}$	$6\overline{)2154}$	$3\overline{)1941}$
	10.	$9\overline{)4806}$	$5\overline{)2615}$	$8\overline{)5520}$
	11.	$7\overline{)6475}$	$9\overline{)4410}$	$4\overline{)2760}$
	12.	$9\overline{)4608}$	$8\overline{)1376}$	$7\overline{)5922}$
$\$\ .85$ $8\overline{)\$6.80}$ 64 40 40	13.	$2\overline{)\$1.18}$	$4\overline{)\$\ .76}$	$3\overline{)\$1.17}$
	14.	$3\overline{)\$2.58}$	$5\overline{)\$4.25}$	$2\overline{)\$\ .94}$
	15.	$6\overline{)\$4.08}$	$8\overline{)\$3.92}$	$5\overline{)\$4.25}$
	16.	$7\overline{)\$3.22}$	$9\overline{)\$2.34}$	$4\overline{)\$1.36}$
$68\ r\ 1$ $2\overline{)137}$ 12 17 16 1	17.	$3\overline{)17}$	$5\overline{)34}$	$8\overline{)62}$
	18.	$4\overline{)39}$	$9\overline{)75}$	$5\overline{)49}$
	19.	$3\overline{)314}$	$5\overline{)1542}$	$8\overline{)644}$
	20.	$2\overline{)721}$	$9\overline{)625}$	$3\overline{)572}$
	21.	$9\overline{)816}$	$7\overline{)6325}$	$6\overline{)1744}$

Can You Find Mistakes?

The examples on this page have been worked. Some of the answers are right and some are wrong. Check each example below to find whether the answer is right or wrong. If it is *right*, write R on your paper. If it is *wrong*, find the mistake and write the correct answer on your paper.

Add.

	a	*b*	*c*	*d*
1.	376 47 69 108 590	57 789 164 2976 3986	2096 585 760 7188 9629	$34.50 9.75 27.08 6.28 $77 61

Subtract.

2.	683 459 236	141 67 74	902 307 695	$5.00 2.29 $2.71

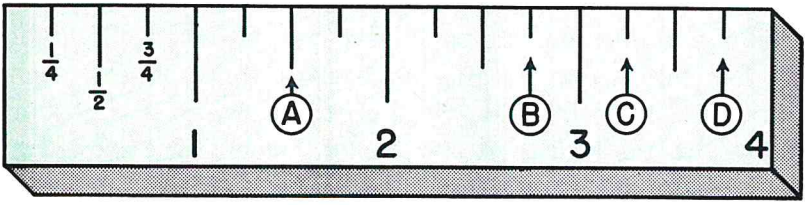
Multiply.

3.	75 8 600	87 5 435	560 6 3366	809 7 623
4.	149 9 1241	$4.56 4 18 24	269 8 2152	$10.60 5 $63.00

Divide.

5.	87 7)609 56 49 49	48 r 6 8)3846 32 64 64 6	42 r 2 6)234 24 14 12 2	$4.80 5)$24.00 20 40 40

Fractions of Inches

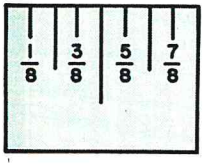


1. The picture above shows a ruler 4 inches long. It is one third of a foot long. Each inch is divided into halves and quarters (fourths). Arrow A points to $1\frac{1}{2}$ inches (one and one half inches). Arrow B points to $2\frac{3}{4}$ inches.

Arrow C points to ? inches. Where does Arrow D point?

2. Can you count by halves? Look at the picture of the ruler and count by halves to 4. Start: $\frac{1}{2}$, 1, $1\frac{1}{2}$.

3. Count by fourths to 4. Start: $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$.



The inch shown at the left is divided into halves, quarters, and eighths.

4. How many fourths make one half inch? $\frac{?}{4} = \frac{1}{2}$

5. How many eighths make $\frac{1}{4}$? $\frac{?}{8} = \frac{1}{4}$

6. How many eighths make $\frac{1}{2}$? $\frac{?}{8} = \frac{1}{2}$

7. How many eighths equal $\frac{3}{4}$? $\frac{?}{8} = \frac{3}{4}$

8. Can you count by eighths? The picture of the inch will help you. Count by eighths to 3. Start: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$.

9. Which fraction of an inch is larger, $\frac{1}{4}$ or $\frac{1}{8}$?

10. Which fraction of an inch is smallest, $\frac{1}{2}$, $\frac{1}{8}$, or $\frac{1}{4}$?

11. Is $\frac{3}{8}$ inch larger or smaller than $\frac{1}{2}$ inch?

12. Which fraction of an inch is larger, $\frac{3}{8}$ or $\frac{1}{4}$?

13. Arrange these fractions in the order of their size, the largest first: $\frac{1}{4}$, $\frac{5}{8}$, $\frac{1}{2}$, $\frac{3}{8}$.

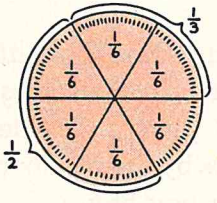
Can You Change Fractions?

1. This is a picture of a candy bar Bill had. Into how many equal pieces is it divided? What fraction of the bar is each part?

Bill shared the candy bar with three of his friends. Each boy got $\frac{1}{4}$ of the bar. How many eighths did each boy get? $\frac{1}{4} = \frac{?}{8}$

2. Copy these fractions and write the missing numbers. The picture of the candy bar will help you.

$\frac{1}{2} = \frac{?}{4}$ $\frac{1}{2} = \frac{?}{8}$ $\frac{1}{4} = \frac{?}{8}$ $\frac{3}{4} = \frac{?}{8}$



3. Into how many equal pieces has this pie been cut? Each piece is $\frac{1}{6}$ of the pie.

4. How many sixths make $\frac{1}{2}$ of the pie? $\frac{?}{6} = \frac{1}{2}$

5. How many sixths make $\frac{1}{3}$ of the pie? $\frac{?}{6} = \frac{1}{3}$

6. How many 6ths make $\frac{2}{3}$ of the pie? $\frac{?}{6} = \frac{2}{3}$

1 whole							
$\frac{1}{2}$				$\frac{1}{2}$			
$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$	
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$

1 whole					
$\frac{1}{2}$				$\frac{1}{2}$	
$\frac{1}{3}$		$\frac{1}{3}$		$\frac{1}{3}$	
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

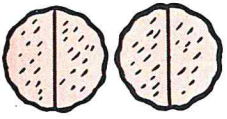
The pictures above show how fractions can be changed.

Copy the fractions below and write the missing numbers.

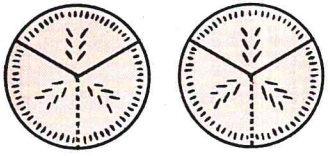
	a	*b*	*c*	*d*
7.	$\frac{2}{8} = \frac{?}{4}$	$\frac{4}{8} = \frac{?}{2}$	$\frac{6}{8} = \frac{?}{4}$	$\frac{2}{4} = \frac{?}{2}$
8.	$\frac{3}{4} = \frac{?}{8}$	$\frac{3}{6} = \frac{?}{2}$	$\frac{2}{6} = \frac{?}{3}$	$\frac{4}{6} = \frac{?}{3}$

Fractions Can Show Division

1. Don grew a big cantaloupe in his garden. He shared it with Bob and Sam. The fraction $\frac{1}{3}$ shows that the one cantaloupe was divided into 3 equal parts. What part of the cantaloupe did each boy get?



2. Sue made two large cookies. She divided them among four girls. To find how much each girl should get, divide 2 (the number of cookies) by 4 (the number of girls). Each girl should get $\frac{2}{4}$ cookies. $\frac{2}{4}$ is the same as what other fraction?



3. Jerry, Bill, and Tom thought they would share 2 small pies left over from a picnic. Divide the number of pies by the number of boys. What fraction of a pie could each boy have?

4. If 4 sandwiches are divided equally among 8 boys, what fraction would show how the sandwiches were divided? Draw a picture of the 4 sandwiches to show what fraction of a sandwich each boy would get.

5. Three candy bars were divided among 4 girls. What fraction shows how the bars were divided? Draw a picture of the bars to show what part of a bar each girl would get.

6. If 2 bricks of ice cream are divided among 6 boys, what part of a brick would each boy get? Draw a picture to show this.

7. If you wanted to cut a 4-foot board into 6 equal parts, what fraction of a foot long would each part be? Check your answer another way, by changing 4 feet to inches.

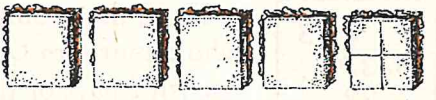
Fractions in Quotients

1. Jean brought 3 apples to school this morning. She wants to share them equally with Ann. To find how many apples each girl gets, divide 3 by 2.

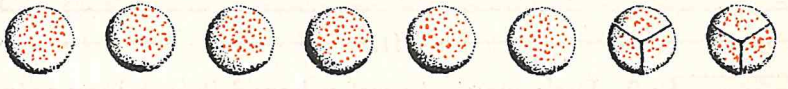
$$2\overline{)3}\quad 1\tfrac{1}{2}\quad \text{remainder } 1$$

Each girl gets 1 whole apple and there is 1 apple left over. Each girl gets half of that apple. How many apples will each girl have? $1 + \frac{1}{2} = ?$

2. Sue has made 5 peanut butter sandwiches for the picnic. She will share them equally with three other girls. Each girl will have 1 whole sandwich, with 1 sandwich left over to be divided into fourths. How many sandwiches will each of the four girls have?



$$4\overline{)5}\quad 1\tfrac{1}{4}\quad \text{remainder } 1$$



3. Bob, Sam, and Don have 8 cookies to share equally. To find how many cookies each boy will get, divide 8 by 3. How many cookies will each boy get?

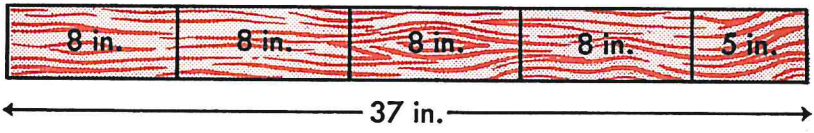
$$3\overline{)8}\quad 2\tfrac{2}{3}\quad \text{remainder } 2$$

Copy and divide. Write each remainder as a fraction.

	a	b	c	d	e	f
4.	$2\overline{)9}$	$3\overline{)7}$	$4\overline{)9}$	$5\overline{)16}$	$4\overline{)21}$	$7\overline{)15}$
5.	$4\overline{)11}$	$5\overline{)23}$	$9\overline{)20}$	$6\overline{)29}$	$8\overline{)35}$	$5\overline{)47}$
6.	$3\overline{)25}$	$5\overline{)32}$	$4\overline{)33}$	$7\overline{)25}$	$9\overline{)85}$	$4\overline{)27}$

Fractions or Remainders?

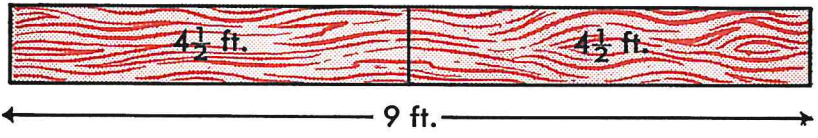
In some division problems, you write the remainder as a fraction. In other division problems, you should leave the remainder as a whole number.



1. Don has a strip of wood 37 inches long. How many garden markers, each 8 inches long, can he cut from it?

$$\begin{array}{r} 4 \text{ r } 5 \\ 8\overline{)37} \\ \underline{32} \\ 5 \end{array}$$

Here, the problem asks you the number of whole markers Don can make. The remainder isn't part of the answer—it is simply the wood that is left over. It would not be sensible to write it as a fraction in the quotient. You leave it as a whole number.



$$\begin{array}{r} 4\frac{1}{2} \\ 2\overline{)9} \\ \underline{8} \\ 1 \end{array}$$

2. Dick wants to cut a board 9 feet long into halves. How many feet long will each half be?

Here, the problem asks you to find the exact length of each half of the board. The whole board is going to be cut into two equal pieces. Nothing is going to be left over. The remainder is an important part of the answer. You should write the remainder as a fraction.

You check both of these division problems in the same way. In Problem 1, you multiply 8×4 and add the remainder, 5, to the product, 32. In Problem 2, you multiply 2×4 and add the remainder, 1, to the product, 8.

Number your paper 3 to 12. Read each of the following division problems. Write R after the problem number if the remainder can be left as a whole number. Write F if the remainder should be written as a fraction. Then write the answer. How many problems can you do as quickies?

3. Bob's father has 7 Indian-head pennies to divide equally between Bob and Sue. How many pennies will each one get?

4. Sue is going to divide 9 pieces of fudge among 4 girls. How many pieces will each girl get?

5. Sally wants to cut a piece of ribbon 17 inches long into four equal parts. How many inches long will each part be?

6. There are 10 marbles to be divided among 3 boys. How many marbles will each boy get?

7. On the golf course, Tom and Bill found 11 lost golf balls. If they share the balls equally, how many will each boy get?

8. Bob wants to put 27 baby chicks into two pens, an equal number in each. How many should go in each pen?

9. Jean, Peggy, and Ann want to share 7 candy bars. How many bars will each girl have?

10. Bill has a quarter. How many 6-cent ice cream cones can he buy?

11. There are 13 boys to play bat ball. If they are divided into two equal teams, how many boys will be on each team?

12. Jean and Ann want dresses alike. Ann's mother bought 7 yards of goods, to be shared equally by the girls. How many yards will each one have for a dress?

Pages 268 and 269 provide enrichment material which can be used after this page.

Some Problems About Money

Number your paper 1 to 21. After each number, write A, S, M, or D to tell whether you will add, subtract, multiply, or divide in that problem. Find the answers and write them after the letters. Can you work any of the problems as quickies?

1. A neighbor pays Jean $1.25 every Saturday afternoon for staying with her little girl. How much money will Jean earn in 4 weeks?

2. Joe wants to buy a record album costing $4.50. He has saved $2.95. How much money does he still need?

3. Mr. Lane spent $1.87 for gasoline and 35 cents for oil for his car. How much did he pay for both?

4. Sam is saving money to buy 4 Christmas presents. He has saved $3.00. If he spends the same amount for each present, how much can he spend per present?

5. Allen paid $5.12 for a camera and some film. If the camera cost $4.55, how much did Allen pay for the film?

6. Sally bought 3 pounds of apples for 25 cents. How much was this for each pound? (Use a fraction in your answer.) If Sally had bought only 1 pound of these apples, how much would she have paid?

7. Besides selling eggs, Bob raises chickens to sell. This year, he wants to buy 125 baby chicks, at 8 cents each. How much will he have to pay for them?

8. Sue sold 6 boxes of candy for 75 cents a box. How much money did she get for all six boxes?

9. If Sue spent $1.37 for the things to make the candy in Problem 8, how much more than her expenses did she make?

10. Jean saw in a store window some handbags that had been $5 each on sale for $3.89. How much had the price of each handbag been reduced?

11. How much money does Ann need to buy a dress costing $6.98 and a hat costing $2.45?

12. Tony wants to buy a baseball glove. He can get a glove for $3.79, but a glove that he likes better costs $5.10. How much more expensive is the glove that Tony prefers?

13. Sally's mother asked her to buy 50 cents' worth of sugar. If sugar is 9 cents a pound, how many pounds can Sally get for 50 cents? How much money will she have left?

14. Don picked 48 ears of corn. He sold it to a store for 3 cents an ear. How much was he paid for the 48 ears?

15. One week Bob sold $12.31 worth of chickens and eggs. He spent $9.75 of this amount for feed and other supplies. How much money did he make?

16. Peggy counted her money and found she had just $4.39. She wanted to buy some ice skates costing $5.25. How much money did she still need?

17. If Ellen saves 5 cents a day, how long will it take her to save 60 cents?

18. Mrs. Lane spent 75 cents for 5 fancy grapefruit. What was the average cost of each grapefruit?

19. Don had 6 rides on the roller coaster, for 15 cents a ride. How much did he spend for them?

20. Bob sold a chicken weighing 5 pounds for 45 cents a pound. How much did he charge for the chicken?

21. Bill is saving to buy a bicycle. He says that he will save half of all the money he earns. Last month he earned $5.30. How much money should he have saved?

Measuring Capacity

Often, you want to know how much a bottle, or a basket, or a can will hold. You want to know the *capacity* of that container.

Fruit and vegetables are often sold in baskets and other containers of various sizes. They are sold by **dry measure.** Units of dry measure are the **pint, quart, peck,** and **bushel.**

Many things, such as milk, ice cream, and paint, are sold by **liquid measure.** Units of liquid measure include the **pint, quart,** and **gallon.**

The pint and quart in *dry* measure are just a little larger than the *liquid* pint and quart.

Do you remember the facts about the units used for measuring capacity? (You will find them on page 313.)

1. What unit of measure do you use to measure gasoline?

2. What unit is generally used to measure cream?

3. Different units of capacity may be used to measure the same thing. Milk, for example, may be measured by the pint, or the quart, or the gallon. Which of these units do you generally use when you buy milk?

4. What unit do you generally use to measure ice cream?

5. What unit do you use most to measure strawberries? To measure raspberries?

6. What unit do you think a farmer generally uses to measure apples?

7. What different units might be used to measure paint when you buy it?

8. What units might be used to measure the oil to put into a car?

9. If a pint of ice cream will serve 3 persons, how many persons will a quart of ice cream serve?

10. Sue and her mother made 3 gallons of tomato juice. They put it into quart jars. How many quart jars could they fill with the 3 gallons of juice?

11. Ellen is buying ice cream for her party. A pint of ice cream costs 35 cents. How much a quart is this?

12. A quart package of ice cream costs 65 cents. How much will Ellen save, in Problem 5, if she buys a quart package instead of 2 pints?

13. Ellen could buy a half-gallon package of ice cream for $1.05. How many quarts is $\frac{1}{2}$ gal.? If a quart of ice cream costs 65 cents, how much will Ellen save by buying the half-gallon package instead of 2 quart packages?

14. If peaches are selling for $2.00 a bushel, how much should Don charge for a peck of peaches?

15. Don sold apples in half-bushel baskets. How many quarts are there in $\frac{1}{2}$ bushel?

16. Ann's father bought two gallons of paint for his garage. When he finished painting it, he had 1 quart left. How many quarts did he use?

17. If raspberries are 30¢ a pint, how much will Mrs. Lane have to pay for 3 quarts of them?

18. Don's father bought a 5-gallon can of oil for his truck. How many quarts of oil did he buy?

19. Sally read on a can of tomatoes that the can held 1 pint 3 ounces. A pint is 16 ounces. How many ounces of tomatoes did the can hold?

20. A large can of tomato juice had a capacity of 1 qt. 2 oz. How many ounces is this, if a quart = 32 oz.?

Can You Do Quickies?

Here are some quickies that use the arithmetic you have been learning this year. See whether you can find all the answers without a pencil. Just tell the answers or write them on your paper.

1. Joe practiced on his trumpet from 9:15 to 9:45. How many minutes did he practice?

2. Bob has an order for 2 dozen eggs. How many eggs must he have to fill the order?

3. Sam and his father went fishing. They caught 13 fish in the morning, and 8 fish in the afternoon. How many fish did they catch that day?

4. Oranges are 4 cents each. How many oranges can I buy for 10 cents? In this problem, is the remainder a whole number or a fraction?

5. Sue squeezes 2 oranges for each member of the family for breakfast. How many persons will a dozen oranges serve?

6. How much money does Peggy need to buy 15 cents' worth of jacks and a 9-cent ball?

7. Larry paid 40 cents for $\frac{1}{2}$ pound of candy. How much a pound is this kind of candy?

8. The thermometer outdoors reads 43°. Indoors it is 68°. How many degrees colder is it outdoors than indoors?

9. A quart of milk will make enough cocoa for 6 people. If Sue wants to make cocoa for 18 people, how many quarts of milk will she need?

10. Don guessed that a large pumpkin weighed 40 pounds. It really weighed 35 pounds. How many pounds too much did Don guess?

11. If Peggy's pony eats 2 quarts of oats a day, how many quarts will the pony eat in a week?

12. Barbara's watch is 4 minutes slow. When her watch says 1: 12, what is the correct time?

13. Don has a 12-quart pail for watering his garden. How many gallons does the pail hold?

14. Nora is reading a book with 160 pages. She is on page 30. How many pages does she still have to read?

15. If a quart of ice cream will serve 6 persons, how many quarts of ice cream will we need for 30 people at our picnic?

16. Jerry is collecting a set of 30 Dutch stamps. He has 22 of these stamps now. How many stamps does he still need?

17. If 3 girls share 2 cookies equally, what part of a cookie does each girl get?

Can You Supply the Missing Signs?

In the following examples, the signs have been left out. Copy the examples and fill in the missing signs.

	a	*b*	*c*	*d*
1.	9?6=3	9?6=54	9?6=15	54?6=9
2.	20?5=4	20?5=25	20?5=15	20?5=100
3.	15?3=12	15?3=5	15?3=45	15?3=18
4.	12?4=16	12?4=3	12?4=8	12?4=48
5.	24?6=30	24?6=18	24?6=4	24?6=144
6.	40?5=35	40?5=8	40?5=45	40?5=200
7.	30?3=10	30?3=33	30?3=27	30?3=90
8.	42?6=48	42?6=7	42?6=36	42?6=252

Can You Work With Numbers?

Diagnostic Check Test 1A

The three check tests on these next four pages will show you how much arithmetic you have learned so far.

This is the first test. It will help you find out how much you know about the four processes. Copy the examples carefully and make sure your answers are correct.

Copy, subtract, and check.

	a	b	c	d	e
1.	405 96	1432 768	4861 1972	$10.03 6.08	$37.50 28.90

Copy, multiply, and check.

2.	68 7	745 9	3092 6	$ .75 8	$18.60 5

Copy, add, and check.

3.	39 86 45 77 78	698 305 267 423 754	8283 985 1692 78 5081	1007 51 448 1036 957	$224.40 70.45 74.08 9.96 397.61

Copy, divide, and check.

4. $7\overline{)62}$ $6\overline{)516}$ $8\overline{)405}$ $4\overline{)676}$ $9\overline{)\$3.42}$

Copy each of the following examples and do what the sign tells you to do.

5. 1081 − 475

6. 7 × 509

7. 530 ÷ 5

8. 79 + 1414 + 508 + 79 + 62

9. $25 − $9.07

10. $2.70 ÷ 6

Do You Understand Numbers?

Diagnostic Check Test 1B

This test will show you how much you know about what numbers mean and do.

1. Write the number that means 27 thousands, 6 hundreds, no tens, 7 ones.

2. In the number 1927, does the 1 or the 9 have more value?

3. Write "nine thousand fifty-one" in figures. What value has each figure in this number?

4. Write the largest 4-figure number you can make with the figures 2, 9, 4, and 7.

5. Write the smallest 3-figure number you can make with the figures 5, 1, and 3.

6. Arrange $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{1}{8}$ in the order of their value, the largest first.

7. Write the two fractions that are missing in this series: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, ?, $\frac{5}{8}$, ?, $\frac{7}{8}$, 1.

8. How many sixths make one half?

9. What number is $\frac{1}{2}$ of 30?

10. What number is twice 18?

11. Which is longer, 5 ft. or 53 in.?

12. What measure is $\frac{1}{2}$ of a quart?

13. What part of a yard is a foot?

14. How many minutes are $\frac{1}{4}$ of an hour?

15. 3:38 means ? minutes before 4.

16. Write the two division facts that depend on $9 \times 6 = 54$.

Can You Use Arithmetic?

Diagnostic Check Test 1C

The test on these two pages will show you how much you have learned about using arithmetic processes in problems. Do you know *when* and *why* you add or subtract or multiply or divide in a problem?

1. Joe started practicing his trumpet lesson at 4:15. He stopped at 4:50. How many minutes had he practiced?

2. In Ben's school there are 119 boys and 93 girls. How many pupils go to that school?

3. Nine boys were playing ball. The ball broke a window. It cost $3.15 to replace the window. If the boys shared the cost equally, what was each boy's share?

4. Don helped his father load 2800 lb. of lime into the truck. How much more than a ton of lime did they put into the truck?

5. Jim gets a nickel for each empty milk bottle he returns to the store. Last week he returned 24 bottles. How much money did he get?

6. Three girls came over to see Ellen, and Ellen made some lemonade. There turned out to be 11 glasses of lemonade. How much lemonade could each of the 4 girls have, if they shared it equally?

7. Ann wants to save five dollars with which to buy Christmas presents for her family and friends. She has already saved $3.85. How much more does she have to save?

8. The Lanes are taking a 358-mile trip. They have gone 170 miles. Have they gone more or less than half way? How many miles more or less than half way have they gone?

9. Sally went to the store for her mother and bought 34 cents' worth of groceries. Sally handed the clerk a dollar bill. How much change did she get back?

10. Bob sold a 4-pound chicken for $1.80. How much did he get per pound?

11. We want to arrange 7 rows of chairs for our play, with 9 chairs in each row. How many chairs do we need?

12. If the Lanes drive 35 miles an hour on the average, how far will they drive in 7 hours?

13. Jerry is mailing a package which he wants to insure for safe delivery. The postage on the package amounts to 28 cents. It costs 15 cents to insure the package. How much will it cost Jerry to send the package?

14. The playground at Bob's school is 97 yards long. How many feet long is it?

15. The playground is 207 feet wide. How many yards wide is it?

16. Bob and Sue are riding with their father and mother in the Grays' family car. Mr. Gray weighs 173 pounds, Mrs. Gray weighs 139 pounds, Bob weighs 106 pounds, and Sue weighs 87 pounds. What is the total weight of the people in the car?

17. Is the total weight of the Gray family more or less than a quarter of a ton? How much more or less?

18. While the Lanes were out driving, Tony saw a sign which said, "Next service station 1000 yards." How many yards more than half a mile is 1000 yards?

19. Saturday morning, Tom helped his father polish the car. He started to work at 9 o'clock and finished at 11: 30. How long did he work on the car?

How Much Is a Million?

Have you any idea how many of anything it takes to make a million?

You know that 10 tens are a hundred. $10 \times 10 = 100$
And you also have learned that 10 hundreds are a thousand.

$$10 \times 100 = 1000$$

Perhaps you have seen 1000 people at a ball game. It would take a thousand times that many people to make a million.

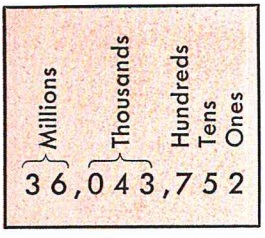
1000 thousands are a **million.** $1000 \times 1000 = 1,000,000$

1. How many zeros are used in writing a thousand? How many zeros are used in writing a million?

2. Are there any cities with a population of more than a million in your state? Find out how many cities near you it takes to make a total of a million people.

3. In 1900, there were about 76 million people in the United States. Now, the population of the United States is more than twice as large as that. Write 76 million in figures. Multiply this number by 2 and read the product.

4. 2,030,420 means 2 million, 30 thousand, 420. In the number 36,043,752, how many millions are there? How many thousands? How many hundreds? How many tens? How many ones?



5. The number 8,350,060 is read eight million, three hundred fifty thousand, sixty. Read 10,073,840, and tell how many millions, thousands, hundreds, tens, and ones there are in it.

6. In the same way, read these numbers and tell what they mean:

a. 17,509,000 **b.** 108,400,673 **c.** 200,984,960

Write the following numbers in figures.

7. Five million, four hundred thousand, seventy-five.

8. Thirteen million.

9. Seven hundred million.

10. One million, two hundred fifty thousand.

11. Two million, seven hundred sixty-eight thousand.

12. Ten million, fifty-six thousand, five hundred.

13. Six million, four hundred twenty-five thousand, sixty.

14. Three hundred seven million, six hundred thousand.

15. Commas help you read large numbers. They separate the hundreds from the thousands, and the thousands from the millions. Copy 3748062 and write commas in it. How many millions are there in this number? Read the number.

16. 7320000 means ? million, ? thousand.

17. 350000000 means ? million.

18. 10080000 means ? million, ? thousand.

19. Place commas in 48769250 and read the number.

20. The number 2,983,250 is almost 3 million. 7,995,000 is almost how many million?

21. 6,011,740 is a little more than ? million.

Write the number that is the nearest million to:

	a	*b*	*c*
22.	4,936,587	15,038,499	32,947,860
23.	486,006,932	409,999,899	21,091,002

24. Write the number that is 1 more than 999,999.

Pages 270 and 271 provide enrichment material which can be used after this page.

Multiplying by Tens

$$\begin{array}{r} 28 \\ \times\ 9 \\ \hline 252 \end{array}$$

1. Don often works on his father's farm. One summer he picked tomatoes. The first day, he picked 9 baskets of tomatoes. Each basket of tomatoes weighed about 28 pounds. To find how many pounds of tomatoes Don picked, multiply 28 by 9. How many pounds did he pick?

$$\begin{array}{r} 28 \\ \times\ 10 \\ \hline 280 \end{array}$$

2. The next day Don picked 10 baskets of tomatoes. To find how many pounds he picked, mutliply 28 by 10. $10 \times 28 = 280$. Do you see why? $0 \times 28 = 0$. 1 ten $\times$ 28 = 28 tens

In the product, 280, the 8 has the value of 80. What value has the 2?

Do you know the short way to multiply by 10?

To multiply any number by 10, add 0 to the number.

$$\begin{array}{r} 28 \\ \times\ 20 \\ \hline 560 \end{array}$$

3. One day, Don picked 20 baskets of tomatoes. Find how many pounds he picked by multiplying 28 by 20.

The example is like multiplying by 10, only you multiply by 2 tens. $0 \times 28 = 0$. 2 tens $\times$ 28 = 56 tens How many pounds of tomatoes did Don pick that day?

4. Don helped his father load 30 bags of lime into the truck. Each bag weighed 50 pounds. To find the total weight of the lime, multiply 50 by 30. Do you see why there are 2 zeros in the product? $0 \times 50 = 0$. 3 tens $\times$ 50 = 150 tens.

$$\begin{array}{r} 50 \\ 30 \\ \hline 1500 \end{array}$$

Any number multiplied by 0 is 0. Zero multiplied by any number is 0.

When any number is multiplied by a number ending in zero, the product always ends in zero.

How many pounds of lime did Don and his father load?

5. Forty pupils from Sam's school went in a bus to visit a museum in the city. The trip cost each pupil \$1.40. To find the total cost, multiply \$1.40 by 40. How much did the trip cost?

$$\begin{array}{r} \$1.40 \\ 40 \\ \hline \$56.00 \end{array}$$

Copy these examples and multiply.

	a	*b*	*c*	*d*	*e*	*f*
6.	36 10	42 20	63 20	51 30	25 30	39 20
7.	47 30	28 40	68 20	17 50	38 30	96 30
8.	68 50	53 40	57 60	65 50	69 30	86 70
9.	93 70	62 60	28 80	36 90	58 20	84 60
10.	10 10	30 10	40 20	70 20	39 60	64 40

	a	*b*	*c*	*d*	*e*
11.	\$ .46 10	\$ .68 20	\$ .75 40	\$1.60 30	\$2.95 60

Multiplying by 2-Figure Numbers

1. The Kings have one of the new small cars. Their car will go 34 miles on a gallon of gasoline. To find how many miles it will go on 12 gallons, multiply 34 by 12.

Long Way

34	34	68
2	10	340
68	340	408

Shorter Way

$$\begin{array}{r} 34 \\ 12 \\ \hline 68 \\ 34 \\ \hline 408 \end{array}$$

There is a long way to do this. Multiplying 34 by 12 is the same as multiplying by 2 ones and 1 ten. $2 \times 34 = 68$ $10 \times 34 = 340$ $68 + 340 = 408$

There is a shorter way to multiply by a two-figure number.

First, multiply 34 by 2 ones. Start writing the product in the ones place.

Then, multiply 34 by 1 ten. Start writing this product in the tens place.

These two products are called the **partial products**. Add them to get the **final product**.

How many miles will the Kings' car go on 12 gallons of gasoline?

Copy and multiply.

	a	*b*	*c*	*d*	e	*f*
2.	38 23	79 27	36 48	74 57	17 40	32 75
3.	75 24	84 98	24 60	69 95	89 47	97 98
4.	54 36	37 16	98 85	69 30	65 79	69 26
5.	54 48	35 50	82 37	85 61	85 90	62 89
6.	96 16	73 39	82 54	78 68	64 70	75 59

Multiplying Money Numbers

1. In Nora's classroom there are 25 dictionaries, one for each pupil. Each dictionary cost $2.75. To find the total cost of the dictionaries for Nora's class, multiply $2.75 by 25.

How do you know the product must be more than $50? What is the total cost of the dictionaries?

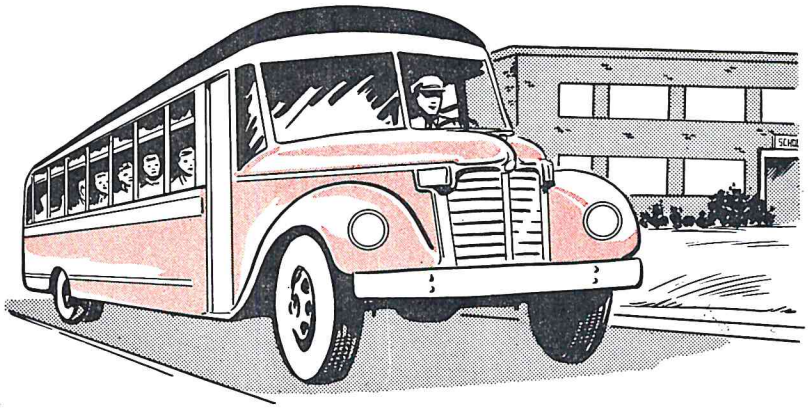
$$\begin{array}{r} \$2.75 \\ 25 \\ \hline 13\,75 \\ 55\,0 \\ \hline \$68.75 \end{array}$$

Copy and multiply.

	a	b	c	d	e
2.	$\$ .35 \times 19$	$\$ .97 \times 32$	$\$ .78 \times 46$	$\$ .94 \times 79$	$\$ .65 \times 64$
3.	$\$1.49 \times 46$	$\$2.50 \times 27$	$\$1.58 \times 85$	$\$3.68 \times 29$	$\$4.60 \times 18$
4.	$\$4.02 \times 35$	$\$1.78 \times 71$	$\$3.60 \times 50$	$\$1.67 \times 93$	$\$3.06 \times 71$
5.	$\$9.70 \times 58$	$\$2.37 \times 80$	$\$2.85 \times 39$	$\$3.20 \times 64$	$\$4.97 \times 75$

Pages 272 and 273 provide enrichment material which can be used after this page.

Checking Multiplication



$ .75	Multiplicand
39	Multiplier
6 75	Partial product
22 5	Partial product
$29.25	Product

1. Thirty-nine boys from Sam's school are going in a bus to a baseball game in the city. Tickets to the game cost 75 cents each. To find the total cost of the tickets for the 39 boys, multiply $.75 by 39. $.75 is called the multiplicand, and 39 is the multiplier.

You can check multiplication by exchanging the multiplier and the multiplicand and multiplying again.

How much did all the tickets cost?

Copy, multiply, and check.

Check
39
75
195
273
2925

	a	*b*	*c*	*d*	*e*	*f*
2.	78 46	93 47	$ .62 58	$ .75 27	86 21	79 92
3.	$ .46 87	72 57	58 92	$ .39 83	36 94	$ .53 36

Arithmetic in Sports

Can you use arithmetic in the games you play and watch? See if you can do some of these problems as quickies.

1. Bill's team played a 7-inning baseball game with Tony's team. Here are the runs by innings.

Bill's team	0	3	0	4	0	2	4
Tony's team	1	2	0	2	3	0	4

How many runs did Bill's team make? How many did Tony's team make? Which team won? How many more runs did they make than the other team?

2. In basketball, a field goal counts 2 points and a foul goal counts 1 point. In a game, the team from Sam's high school made 18 field goals and 12 foul goals. How many points did the 18 field goals count? How many points did the team make altogether?

3. At one time during the game, the score was 23 to 16 in favor of Sam's team. How many points was Sam's team ahead?

4. Bill's father likes to play golf. One Saturday, Bill went with his father to the golf course to caddy for him. They walked 285 yards to the first hole. They walked 320 yards to the second hole. How much longer was the distance to the second hole than to the first hole?

5. The distance to the third hole was only 190 yards. What was the total distance of the first three holes?

6. Bill's father lost 3 golf balls. He had paid 75 cents apiece for them. What was their total cost?

7. Bill received 75 cents for caddying 3 hours. How much an hour did he earn?

Multiplication Quickies

Here are some short cuts that will help you multiply "in your head." You can find the answers without using a pencil. Just tell the answers or write them on your paper.

1. There are 29 pupils in Lorna's room. The school furnishes each pupil 10 pencils a year. How many pencils are needed in all for Lorna's class for a year?

In this problem, you are to multiply 10 by 29, since you are to find twenty-nine 10's. But it is easier to multiply by 10. You know that an easy way to multiply any number by 10 is to write 0 after the number. $10 \times 29 = ?$

Give the missing products.

	a	*b*	*c*
2.	$10 \times 35 = ?$	$10 \times 68 = ?$	$10 \times 30 = ?$
3.	$10 \times 90 = ?$	$10 \times 127 = ?$	$10 \times 240 = ?$

4. Bob wants to buy 75 baby chicks at 10 cents each. To find the total cost, multiply 75 by 10. Don't forget your answer is dollars and cents.

5. Jill is secretary of her 4-H club. She wants to buy 70 two-cent stamps. How much will Jill have to pay for the stamps?

6. The pupils in Dick's school are going to a concert in a neighboring school. There are 10 school buses to carry them. How many pupils can 10 buses carry if each bus holds 30 children?

7. How many pencils will be needed in a school with 289 pupils if the school furnishes each pupil with 10 pencils during the school year?

8. We want to sell 85 tickets for our play at 10 cents each. If we sell them all, how much money will we take in?

9. Find the total cost of 350 one-cent pencils.

10. Last summer, Tom's family rented a cottage in the mountains. They bought ice for their refrigerator at an ice house where ice was sold for 1 cent a pound. One day they bought a cake of ice weighing 110 pounds. How much did they pay?

11. Jill was reading a new flower catalog. She saw that tulip bulbs were being sold at a special price of 10 cents each. Jill decided to buy 50 bulbs. How much did they cost her in all?

12. Don's father pays him 1 cent a pound for picking and packing peaches. How much will Don get for 260 pounds of peaches?

13. Don picked 19 pounds of tomatoes in his garden. He sold them for 10 cents a pound. How much money did he get for his tomatoes?

14. Don plans to save $5 a month for 10 months. How much money can he save in this time?

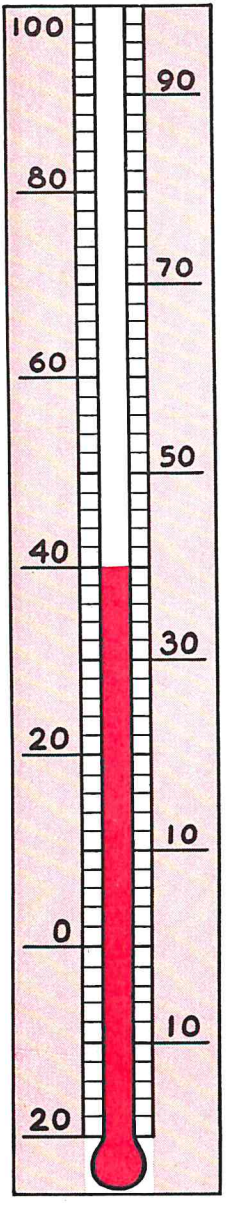
15. Movie tickets are 35 cents each. If Ellen takes 9 other girls to the movie as part of her birthday party, how much in all must she pay for tickets?

16. Jill sold a dozen roses separately, for 10 cents a rose. How much did she get for the dozen?

17. Mr. Gray took Sue, Bob, and Sam to the fair. He bought them 27 rides at the amusement park, for 10 cents a ride. How much did all the rides cost?

18. Jerry's mother has asked him to buy one hundred 3-cent stamps for her at the postoffice. How much money will Jerry need to pay for the stamps?

Measuring Heat



1. One morning in early winter, Tom looked at the thermometer outside his front door. At the left is a picture of the thermometer Tom saw. It showed that the temperature was 40 degrees. The temperature at which water freezes is 32°, so 32° is called the **freezing point of water.** How many degrees above freezing is 40°?

A **thermometer** is used to measure temperature, or heat. "Thermometer" means "heat measurer."

2. At noon that day, the temperature rose to 56°. Can you find 56° on the thermometer? How many spaces is it above the 50° mark? How many degrees does each space measure?

56° is how many degrees warmer than 40°? 56° is how many degrees above freezing?

3. On a very cold day, Tom read the temperature outside the school, and inside the school room. The temperature outdoors was 12 degrees below zero (−12°). The temperature indoors was 68°. Find −12° and 68° on the thermometer.

To find how many degrees colder it was outdoors than indoors, *add* 12 and 68. Why? How many degrees colder was it?

4. How many degrees above freezing is 68°? How many degrees below freezing is −12°?

5. The temperature of your body is just above 98°. About how many degrees above freezing is this?

6. One spring morning, the temperature was 43°. Later, it rose to 71°. How many degrees warmer did it get?

Water boils at 212°. This temperature is called the boiling point of water.

7. How many degrees above the *freezing* point is the *boiling* point of water?

8. The average January temperature in Miami, Florida, is 68°. In Fairbanks, Alaska, it is −11°. How many degrees warmer is it in Miami than in Fairbanks?

9. In Madison, Wisconsin, the highest temperature ever recorded is 107°, and the lowest is −29°. What is the difference between these two temperatures?

10. One week, Tom read the temperature outdoors every school day at 9:00 a.m. It was 16°, 27°, 34°, 20°, and 18°. To find the average temperature, add the five numbers and divide by 5. What was the average temperature for the 5 days? How many degrees below the average was the reading on the first day (16°)?

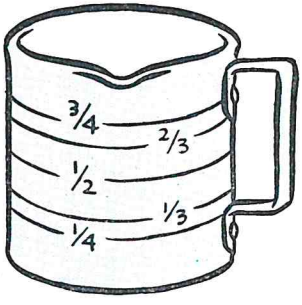
11. The temperature of a hot oven is 450°. How much hotter is this than the boiling point of water?

12. Sue was making some popcorn balls. She had to boil the sirup until her candy thermometer said 290°. How many degrees higher than the boiling point of water was this?

13. One night, the radio announcer said that the coldest temperature that day in the United States was 36° below zero. The warmest was 74° above zero. How many degrees colder was the coldest place than the warmest place?

Pages 274 and 275 provide enrichment material which can be used after this page.

Using Measures in Cooking



Sue likes to cook. She has to use measures many times in her cooking. One of the measures she uses most frequently is the measuring cup. The picture at the left shows a measuring cup.

It takes 2 cups of sugar, or flour, or milk to make a pint. It takes 16 tablespoons of sugar, measured level, to fill a cup. Three teaspoons make a tablespoon.

1. Look at the picture of the measuring cup. Which is more, $\frac{1}{3}$ cup or $\frac{1}{4}$ cup ? $\frac{2}{3}$ cup or $\frac{3}{4}$ cup?

2. There are 2 cups in a pint. What part of a pint is a cup? How many cups of milk are there in one quart of milk?

3. If milk costs 20 cents a quart, what is the cost of a cup of milk?

4. Four cups of flour weigh 1 pound. What part of a pound does 1 cup of flour weigh? At 8¢ a pound, what does a cup of flour cost?

5. Two cups of sugar weigh 1 pound. What part of a pound does 1 cup of sugar weigh? At 10 cents a pound, what does a cup of sugar cost?

6. There are 16 tablespoons in a cup. Sue used 4 tablespoons of flour in some gravy. What part of a cup of flour did she use?

7. A muffin recipe calls for two tablespoons of sugar. Sue has only a teaspoon for measuring. How many teaspoons of sugar should she use?

8. Sue uses 2 ounces of chocolate every time she makes fudge. How many times can she make fudge with 1 pound of chocolate?

9. When Sue makes fudge, she heats the mixture to 236°. Then she cools it to 110° before she beats it. How many degrees cooler is 110° than 236°?

10. Sue's mother says that a lamb roast should be cooked 30 minutes for each pound. How many minutes should a 3-pound lamb roast be cooked? How many minutes more than 1 hour will it take to cook that roast?

11. Sue's father likes his eggs boiled for $3\frac{1}{2}$ minutes. How many seconds more than 3 minutes is that?

12. It takes about 25 minutes to bake muffins. If Sue puts her muffins into the oven at 8:15, when should she take them out?

13. Sue put some biscuits into the oven at 10 minutes of 8. She took them out at 5 minutes past 8. How many minutes had they been in the oven?

Can You Do These?

1. Find the difference between 1305 and 977.
2. Find the product of 46 and 72.
3. Find the sum of $39.85 and $7.15.
4. Write the number that is 89 more than 267.
5. Divide 31 by 8, writing the remainder as a fraction.
6. Write the number that is 6 times as large as 48.
7. Write the number that is 107 less than 508.
8. Write the number that is one fifth of 875.
9. Find the answer to this example: $18 \times 64¢$.
10. Work this example: $\$2.07 \div 9$.
11. Copy and write the missing sign: $64 \; ? \; 8 = 8$.
12. Write the missing sign in $72 \; ? \; 8 = 80$.
13. Write the missing sign in $72 \; ? \; 8 = 64$.
14. Write the missing sign in $8 \; ? \; 32 = 256$.
15. Tell how many millions there are in 30000000.
16. Write "twelve million sixty thousand" in figures.
17. Write the temperature that is 39° above freezing.
18. Write the temperature that is 26° cooler than 80°.
19. Write the missing number in $54 \div ? = 9$.
20. Write the missing number in $7 \times ? = 56$.
21. Write two addition facts and two subtraction facts using the numbers 9, 7, and 16.
22. Write two multiplication facts and two division facts with the numbers 9, 7, and 63.
23. Write the largest 4-figure number you can with the figures 5, 2, 9, 3.

Keeping Up Your Addition Skills

Practicing addition will enable you to keep up and improve the skills you need. The examples on this page will help you keep up your addition skills. Copy the examples, add, and check.

Are you sure of your carrying?

	a	*b*	*c*	*d*	e
1.	26 57	17 73	58 59	209 64	138 342
2.	446 293	277 456	408 697	850 690	6388 1714

Can you add columns?

3.	9 3 8 7 7	50 46 89 30 57	119 307 88 265 85	443 569 295 674 460	3177 5829 80 3491 908

Can you add dollars and cents?

4.	\$ .39 .48	\$ .73 .57	\$4.06 3.26	\$3.65 7.88	\$76.47 20.95
5.	\$7.16 1.04 4.65 7.77	\$3.38 1.36 .72 5.89	\$71.77 42.07 44.81 9.65	\$65.72 78.90 33.43 26.96	\$ 73.57 139.09 411.30 8.25

Can you copy in columns and add?

6. $9 + 82 + 107 + 810$

7. $648 + 83 + 2361 + 609 + 9218$

8. $\$115.67 + \$8.73 + \$.99 + \$77.06 + \$7.50$

Keeping Up Your Subtraction

Do these subtraction examples to keep up your subtraction skills. Copy, subtract, and check.

Are you sure of these subtraction facts?

	a	b	c	d	e	f	g
1.	17 − 8	11 − 9	13 − 5	14 − 7	12 − 4	11 − 6	16 − 7
2.	22 − 8	21 − 3	25 − 9	13 − 7	31 − 5	25 − 6	34 − 8

Can you borrow?

	a	b	c	d	e
3.	72 − 47	93 − 66	85 − 58	68 − 29	131 − 62
4.	156 − 59	121 − 48	175 − 87	133 − 59	131 − 97
5.	952 − 563	647 − 349	547 − 493	863 − 698	975 − 278

Can you use zeros?

6.	610 − 607	607 − 140	903 − 706	1110 − 381	1000 − 946

Can you subtract money numbers?

7.	\$5.00 − 2.25	\$6.02 − 5.75	\$10.91 − 9.88	\$15.00 − 7.82	\$50.00 − 15.69

Can you copy and subtract in columns?

	a	b	c
8.	100 − 37	1783 − 478	902 − 417
9.	1021 − 79	1508 − 880	2177 − 659
10.	\$2.80 − 77¢	\$5 − \$3.95	\$36.25 − \$9.90

Multiplying by 3-Figure Numbers

1. Nora wanted to know about how many words there were in a 168-page book. She found that there were about 384 words on a page. On 168 pages, then, there would be about 168 × 384 words.

When you multiply 384 by 168, how many partial products are there? You start writing the first partial product in the *ones* place, because you are multiplying by 8 *ones*. You start writing the second partial product in the tens place, because you are multiplying by 6 tens. You begin the third partial product in the *hundreds* place, because you are multiplying by 1 *hundred*.

How many thousands are there in the answer? Where do you write the comma in the product to show the thousands?

Explain how the work is checked.

Example

$$\begin{array}{r} 384 \\ \times\ 168 \\ \hline 3072 \\ 2304 \\ 384 \\ \hline 64512 \end{array}$$

Check

$$\begin{array}{r} 168 \\ \times\ 384 \\ \hline 672 \\ 1344 \\ 504 \\ \hline 64512 \end{array}$$

2. The principal of Bill's school said it cost \$1.25 a day to educate each pupil in his school. There are 184 school days in this school year. Find how much it will cost to educate Bill this year by multiplying \$1.25 by 184. Check your work.

Copy, multiply, and check.

	a	*b*	*c*	*d*	*e*
3.	97 × 138	64 × 168	928 × 248	869 × 875	974 × 549
4.	\$3.78 × 3 75	\$8.64 × 4 19	\$6.49 × 2 67	\$9.32 × 3 48	\$6.59 × 5 92

Multiplying With Zeros

\$1.75
3 09
15 75
525 0
\$540.75

1. Nora counted 309 books in the story section of the school library. Miss Martin said that the average cost of the books was about \$1.75 apiece. To find the total cost of the books, multiply \$1.75 by 309.

You multiply by 9 ones, and start writing the partial product in the *ones* place. You do not multiply by any tens, because there are no tens in 309. You may put a zero in the *tens* place to show there are no tens. When you multiply by the 3 hundreds, you start writing the partial product in the *hundreds* place.

How do you estimate that the total cost of the books should be more than \$300 and less than \$600?

Copy, multiply, and check.

	a	*b*	*c*	*d*	*e*
2.	743 108	896 405	697 630	569 280	705 409
3.	\$4.92 6 09	\$7.08 2 60	\$8.09 7 09	\$7.45 7 50	\$1.85 3 06

How Well Can You Multiply?

The examples on this page will show you how well you have learned to multiply various sorts of numbers. Do you know how to carry when you multiply by a 1-figure number? (Example 1.) Can you multiply a 2-figure number or a 3-figure number by a 2-figure number? (Examples 2-5.) Can you multiply by a 3-figure number? (Examples 6-8.)

Can you use zeros in multiplying? Can you multiply money numbers? Do you know how to check your multiplication?

Copy, multiply, and check.

	a	*b*	*c*	*d*	*e*
1.	94 × 8	72 × 6	907 × 7	480 × 5	362 × 9
2.	47 × 15	63 × 58	48 × 72	56 × 93	37 × 74
3.	49 × 39	80 × 90	62 × 78	53 × 70	97 × 28
4.	235 × 58	497 × 27	658 × 98	609 × 74	540 × 45
5.	$ .76 × 29	$0.34 × 94	$2.45 × 36	$7.69 × 49	$2.57 × 83
6.	345 × 428	369 × 263	657 × 574	498 × 864	875 × 824
7.	609 × 240	305 × 603	708 × 306	503 × 790	750 × 805
8.	$8.50 × 1 27	$2.75 × 3 46	$4.95 × 1 09	$9.04 × 5 07	$6.78 × 6 90

Measure Quickies

How well can you use measures in problems? If you know the measure facts you have had, you should be able to solve all these problems as quickies. Just tell the answers, or write them on your paper.

1. Bill wants to save money regularly so he will have enough to buy a new bicycle when his old bike wears out. If he saves $2 a month regularly, how much will he save in a year?

2. Mrs. Lane bought 2 gallons of maple sirup. She wants to put it into quart jars. How many jars does she need?

3. How much change should Jean get from a quarter if she spends 8 cents for an ice cream sandwich?

4. Don has a dozen ears of corn to sell. If he gets 4 cents an ear for it, how much money will he get?

5. If today is December 12, what will be the date one week from today?

6. Sam caught a trout 1 foot long. In his state, a trout must be 7 inches long before it can be kept. Could Sam keep it? Why?

7. Nancy wants to practice her piano lesson for an hour. After she has practiced 40 minutes, how many minutes more must she practice?

8. Ellen paid 40 cents for a pint of ice cream. How much is this a quart?

9. Jim's sister is just 4 feet tall. How many inches tall is she?

10. Don's father has a truck that will carry a load of 5 tons. How many pounds can the truck carry?

11. Don is picking a bushel of cherries for his mother to can. He has already picked 20 quarts. How many more quarts must he pick?

12. "Thirty days have September, April, June, and November." All the rest of the months have 31 days, except February. How many weeks are there in January? How many days over?

13. Tom kept track of the weather one June. It rained or was cloudy on 12 days. How many clear days were there that month?

14. Jean wants some colored pencils costing a nickel each. She has a quarter that she could spend for pencils. How many pencils can she get with her quarter?

15. At camp last summer, Bill learned how to swim. By the end of the summer, he could swim 20 yards. How many feet could he swim?

16. Bill spent July and August at camp. How many days did he have at camp?

17. Sally bought a 2-ounce package of salted peanuts. How many packages of this size does it take to make a pound?

18. Dave's mother said that paper napkins for their family cost about 1 cent a day. How much is that for a year that is not a leap year?

19. Mr. Lane's train was due at 10: 55, but it is 15 minutes late. When should it come?

20. Joe's watch is 3 minutes fast. When his watch shows 2 o'clock, what is the correct time?

21. Early one morning, the temperature was 4° below zero. At noon it was 25° above zero. How many degrees warmer was it at noon?

Which Process Do You Use?

These problems do not have any numbers in them, so you don't have to work them. Number your paper 1 to 18. Read each problem carefully and decide which process you would use to work it. Then write Add, Subtract, Multiply, or Divide on your paper after the number of each problem.

1. You know how many pounds Joe weighs and how many pounds Jerry weighs. How do you find out how much heavier one boy is than the other?

2. You know how many minutes Nancy practices before she goes to school and how many minutes she practices when she comes home. How do you find the total number of minutes Nancy practices?

3. You know how much one baseball suit costs. How do you find how much a baseball team must pay for suits for all the players?

4. You know the price of a pencil. How do you find how many pencils you can buy with the money you have?

5. You know the price of a pair of roller skates. You know how much money Peggy has saved toward the cost of the skates. How do you find how much money Peggy still needs to buy the skates?

6. You know how many rows of seats there are in the auditorium. You know how many seats there are in each row. How do you find how many seats there are in the auditorium?

7. You know the price of each of two footballs. How do you find how much cheaper one football is than the other?

8. You know how many marbles Bill has and how many marbles Jim has. How do you find how many marbles both boys have?

9. You know how many miles Mr. Lane drove on a trip, and how many gallons of gasoline his car used on the trip. How do you find how many miles the car went on one gallon of gasoline?

10. You know how many miles an airplane flies in an hour. How do you find how far it can fly in a certain number of hours?

11. You know how many miles an hour you can walk. If you keep to the same speed, how do you find how many hours it will take you to walk a certain number of miles?

12. You know how much a baseball glove costs and how much a bat costs. How do you find how much Dave must pay for both of these things?

13. You know how much you paid for several pounds of sugar. How do you find the price of each pound?

14. You know how much money you have and how much money you are going to spend. How do you find how much money you will have left?

15. You know how many tables there are in a school cafeteria. You know the tables are all the same size, and how many pupils each table will seat. How do you find how many pupils can eat in the cafeteria at one time?

16. You know how many miles you went in the family car and how many hours you traveled. How do you find the number of miles you went per hour on the average?

17. You know how tall you were last year and how tall you are now. How do you find how much you have grown in a year?

18. You know how many cups of milk a recipe for hot chocolate calls for. You want to double the recipe. How do you find how much milk you will need?

Can You Make Up Questions?

Finish these problems by writing a good question for each problem. Then solve the problems and write the answers on your paper.

1. We are arranging 72 chairs for a school program. We want to put them in 6 equal rows.

2. Don sold 15 pumpkins from his garden. He got 20 cents for each pumpkin.

3. Bill bought a pair of ice skates for $5.25 and a hockey stick for 95 cents.

4. Mary is 53 inches tall. Larry is 61 inches tall.

5. Tony helped his father wash and polish the car. His father paid him $1.40 for working 4 hours.

6. Sally's mother sent her to the store with a $5.00 bill to buy groceries. Sally bought $3.48 worth of groceries.

7. Ann went with her father in an airplane to visit her grandfather. The airplane flew 1500 miles in 6 hours.

8. Jill has 75 cents to buy some pansy plants that cost 3 cents each.

9. Bill's father took him on a deep-sea fishing trip. Bill caught a fish that weighed 9 pounds. His father caught a 15-pound fish.

10. Peggy is learning how to play tennis. She wants to buy 3 tennis balls costing 65 cents each.

11. Don helped his father load 36 baskets of apples into the truck. Each basket weighed 28 pounds.

12. Dick made a bookcase and sold it for $10. The wood and other materials cost $2.75.

Fun With Problems

Making up problems can be fun. Make up problems of your own as suggested on this page. Write your problems plainly and use reasonable numbers, so that it will be easy for someone else to work your problems.

Put your problems with those made up by the rest of the class. Then draw out a set of someone else's problems to work.

1. Make up an addition problem about buying two things you would like to have.

2. Make up a multiplication problem about earning money by working for several hours.

3. Make up a subtraction problem about how many pounds you have gained in the last year.

4. Make up a division problem about how many bricks of ice cream you will need for a party.

5. Make up a multiplication problem about how much you must pay for several things, such as cupcakes.

6. Make up a subtraction problem about sawing off a piece of board to make something.

7. Make up an addition problem about what is the correct time when the clock is slow.

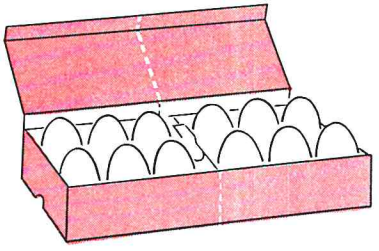
8. Make up a subtraction problem about saving money to buy something you want very much.

9. Make up a division problem about how much each thing costs when you buy several things, such as doughnuts.

10. Make up a subtraction problem about how many inches taller one boy (or girl) is than another.

Fractions of Measures

See how much you know about fractions of measures. Some of the fractions on these two pages you have been using for some time. Others may be new to you.



1. Here is a picture of one of the boxes Bob uses for his eggs. The box holds a dozen eggs.

How many eggs are $\frac{1}{2}$ dozen eggs? $\frac{1}{2}$ of 12 = ?

2. How many eggs are $\frac{1}{4}$ dozen eggs? $\frac{1}{4}$ of 12 = ?

3. How many eggs are $\frac{1}{3}$ dozen? $\frac{1}{6}$ dozen?

4. Three eggs are *one* fourth of a dozen. Then how many eggs are *three* fourths ($\frac{3}{4}$) of a dozen? $\frac{3}{4}$ of 12 = ?

5. Four eggs are *one* third of a dozen. Then how many eggs are *two* thirds ($\frac{2}{3}$) of a dozen? $\frac{2}{3}$ of 12 = ?

6. *One* sixth of the eggs is 2 eggs. *Five* sixths ($\frac{5}{6}$) of the eggs are the rest of the dozen eggs. $\frac{5}{6}$ of 12 = ?

Copy and fill in the missing fractions.

	a	*b*	*c*
7.	2 eggs = ? doz.	3 eggs = ? doz.	4 eggs = ? doz.
8.	8 eggs = ? doz.	9 eggs = ? doz.	10 eggs = ? doz.

9. Which is more, $\frac{1}{2}$ dozen or $\frac{1}{4}$ dozen?

10. Which is less, $\frac{1}{3}$ dozen or $\frac{1}{6}$ dozen?

11. Is $\frac{1}{4}$ dozen more or less than $\frac{1}{3}$ dozen?

12. Which is more, $\frac{2}{3}$ dozen or $\frac{3}{4}$ dozen?

13. Which is less, $\frac{5}{6}$ dozen or $\frac{3}{4}$ dozen?

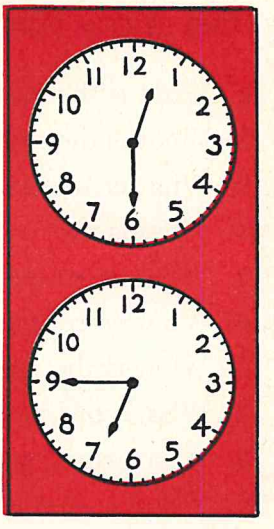
14. The top clock at the right shows half past 12, or 12: 30. How many minutes are there in $\frac{1}{2}$ hour? $\frac{1}{2}$ of 60 = ?

15. One quarter hour equals how many minutes? $\frac{1}{4}$ of 60 = ?

16. Tell in two ways the time the lower clock shows. How many minutes are there in three quarters of an hour? $\frac{3}{4}$ of 60 = ?

17. Twenty minutes are one third of an hour. How many minutes are there in two thirds of an hour? $\frac{2}{3}$ of 60 = ?

18. How many minutes are one sixth of an hour? $\frac{1}{6}$ of 60 = ?



19. How many minutes are five sixths of an hour? $\frac{5}{6}$ of 60 = ?

Copy and fill in the missing fractions.

	a	*b*	*c*
20.	10 min. = ? hr.	15 min. = ? hr.	20 min. = ? hr..
21.	40 min. = ? hr.	45 min. = ? hr.	50 min. = ? hr.

22. Which is longer, $\frac{1}{2}$ or $\frac{2}{3}$ hour?

23. Is $\frac{2}{3}$ hour longer or shorter than $\frac{3}{4}$ hour?

24. Which is shorter, $\frac{5}{6}$ hour or $\frac{3}{4}$ hour?

25. Which is longest, $\frac{1}{3}$ hour, $\frac{2}{3}$ hour, or $\frac{5}{6}$ hour?

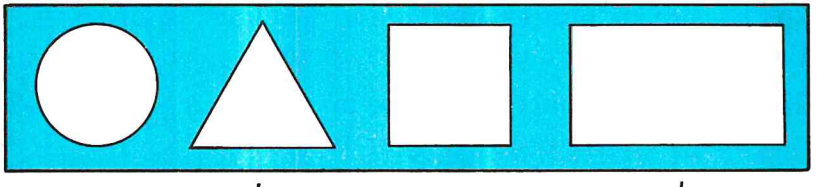
26. How many ounces are there in $\frac{1}{4}$ pound? $\frac{1}{4}$ of 16 = ? How many ounces are there in $\frac{3}{4}$ pound? $\frac{3}{4}$ of 16 = ?

27. How many ounces are there in $\frac{1}{8}$ pound? $\frac{1}{8}$ of 16 = ? How many ounces in $\frac{5}{8}$ lb.? $\frac{5}{8}$ of 16 = ?

Pages 276 and 277 provide enrichment material which can be used after this page.

Do You Know Arithmetic Names?

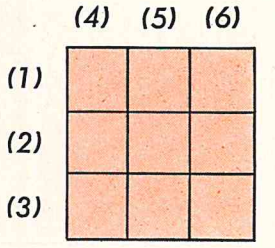
1. What is the word that means one half of a quart?
2. What is the name of a quarter of a gallon?
3. What is another name for one third of a yard?
4. What is the name for 16 ounces?
5. What word means 24 hours?
6. What word means 12 months?
7. What is the name for 60 seconds?
8. What word means 60 minutes?
9. What word means 32 quarts?
10. What is another name for 2000 pounds?
11. What distance is 1760 yards equal to?
12. What is the answer in addition called?
13. The answer in ? is called the difference or the remainder.
14. The quotient is the name of the answer in ? .
15. What is the name of the answer in multiplication?
16. The number you divide by is called the divisor. What is the number you multiply by called?
17. What does "minus" tell you to do?
18. What does "plus" tell you to do?
19. Minuend, subtrahend, remainder are terms used in ?
20. Give the name of each of these four figures:



a *b* *c* *d*

Fun With Numbers

Copy on your paper the square at the right. Then find the answers to the six following examples and write them in your square. The answers to Examples 1, 2, and 3 are written *across* the square, and the answers to Examples 4, 5, and 6 are written *down*.



If your work is correct, the right answers to (4), (5), and (6) down will be filled in as you do (1), (2), and (3) across. If your answers are *not* the same as those already in the square, check to find where you made a mistake.

Work each example by doing what the signs tell you to do. So, in Example 1, you start with $9 \times 2 = 18$, then $18 \div 3 = 6$, then $6 + 9 = 15$, and so on.

1.	9	× 2	÷ 3	+ 9	× 10	+ 36	− 12
2.	7	+ 8	× 2	− 5	÷ 5	× 60	− 8
3.	8	× 7	+ 4	÷ 4	+ 9	× 18	+ 48
4.	5	+ 15	÷ 2	× 10	− 25	× 2	− 26
5.	6	× 9	− 18	× 25	÷ 2	+ 400	− 52
6.	4	+ 16	× 12	÷ 3	+ 4	× 10	÷ 2

Now copy the square again and use the examples below.

1.	24	÷ 3	× 7	+ 4	÷ 4	× 30	+ 64
2.	24	− 8	× 5	÷ 4	+ 15	− 7	× 18
3.	16	+ 12	÷ 7	× 20	− 5	× 10	− 42
4.	54	÷ 6	× 7	+ 12	÷ 5	× 40	− 43
5.	56	÷ 8	+ 8	× 8	− 8	+ 88	÷ 2
6.	48	+ 12	÷ 3	× 5	− 10	× 5	− 2

Changing Fractions to Easier Forms

$$1\tfrac{4}{8} = 1\tfrac{1}{2}$$

$$8\overline{)12}$$

$$\underline{8}$$

$$4$$

1. At our picnic, we want to divide 12 candy bars equally among 8 people. Divide 12 by 8. Each person will get $1\frac{4}{8}$ bars. In the fraction $\frac{4}{8}$, the 4 above the line is the remainder; the 8 below the line is the divisor. It means 4 is divided by 8.

The candy bar is divided into 8 equal parts. Four eighths are the same as $\frac{1}{2}$ of the bar. Each person will get $1\frac{1}{2}$ bars.

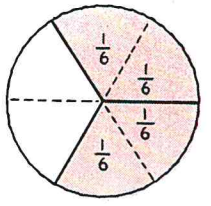
The picture will help you change each of these fractions to a simpler form. $\frac{2}{8} = ?$ $\frac{4}{8} = ?$ $\frac{6}{8} = ?$ $\frac{2}{4} = ?$

$$3\tfrac{4}{6} = 3\tfrac{2}{3}$$

$$6\overline{)22}$$

$$\underline{18}$$

$$4$$



2. Six boys are to share 22 cookies equally. Divide 22 by 6. Each boy will get $3\frac{4}{6}$ cookies.

The drawing shows that $\frac{4}{6}$ of a cookie is the same as $\frac{2}{3}$ of a cookie. You can say that each boy gets $3\frac{2}{3}$ cookies.

Change each fraction to a simpler form: $\frac{2}{6} = ?$ $\frac{3}{6} = ?$

Copy and divide. Change each fraction to a simpler form.

	a	b	c	d	e
3.	$4\overline{)30}$	$6\overline{)20}$	$8\overline{)44}$	$8\overline{)58}$	$6\overline{)51}$
4.	$8\overline{)78}$	$6\overline{)40}$	$4\overline{)22}$	$6\overline{)57}$	$8\overline{)54}$
5.	$8\overline{)116}$	$8\overline{)162}$	$4\overline{)116}$	$6\overline{)290}$	$4\overline{)274}$

Which Measure Is Larger?

To answer these questions, you must know measure facts and how to find fractions of measures. See how many questions you can answer without using your pencil.

1. Which is more, $\frac{1}{2}$ doz. eggs or 7 eggs?
2. Which is more, $\frac{2}{3}$ doz. oranges or 9 oranges?
3. Which is longer, $\frac{3}{4}$ ft. or 8 in.?
4. Which is longer, $\frac{1}{3}$ yr. or 3 mo.?
5. Which is more, $\frac{3}{4}$ gal. or 2 qt.?
6. Which is heavier, $\frac{1}{4}$ lb. or 3 oz.?
7. Which is heavier, $\frac{3}{4}$ lb. or 10 oz.?
8. Which is longer, $\frac{1}{4}$ hr. or 20 min.?
9. Which is longer, $\frac{3}{4}$ hr. or 40 min.?
10. Which is longer, $\frac{2}{3}$ hr. or 45 min.?
11. Which is heavier, $\frac{1}{2}$ ton or 900 lb.?
12. Which measure is larger, $\frac{1}{2}$ qt. or 2 pt.?
13. Which measure is larger, $\frac{1}{2}$ gal. or $\frac{1}{4}$ gal.?
14. Which is more, $\frac{1}{6}$ doz. or $\frac{1}{4}$ doz.?
15. Which is longer, $\frac{1}{3}$ hr. or $\frac{1}{2}$ hr.?
16. Which is heavier, $\frac{1}{4}$ lb. or $\frac{1}{8}$ lb.?
17. Which is more, $\frac{3}{4}$ doz. or $\frac{1}{2}$ doz.?
18. Which is longer, $\frac{1}{8}$ ft. or $\frac{2}{3}$ ft.?
19. Which is heavier, $\frac{1}{4}$ ton or $\frac{1}{2}$ ton?
20. Which is longer, $\frac{1}{2}$ hr. or $\frac{3}{4}$ hr?
21. Which is longer, $\frac{1}{2}$ hr. or $\frac{2}{3}$ hr.?

Preparing for Two-Figure Division

On page 96, you are going to start dividing by two-figure numbers. The examples on pages 94 and 95 will help you get ready for this kind of division. They will give you practice in some skills you will use when you divide by a two-figure number.

Copy the following examples and write only the quotients. You need not write the remainders.

	a	*b*	*c*	*d*	e
1.	$2\overline{)13}$	$3\overline{)14}$	$3\overline{)25}$	$4\overline{)30}$	$5\overline{)19}$
2.	$5\overline{)47}$	$6\overline{)46}$	$3\overline{)29}$	$7\overline{)37}$	$4\overline{)26}$
3.	$8\overline{)67}$	$6\overline{)53}$	$7\overline{)24}$	$5\overline{)22}$	$9\overline{)30}$
4.	$4\overline{)22}$	$8\overline{)74}$	$9\overline{)56}$	$6\overline{)40}$	$8\overline{)50}$
5.	$5\overline{)41}$	$7\overline{)69}$	$8\overline{)47}$	$4\overline{)37}$	$8\overline{)15}$
6.	$6\overline{)29}$	$8\overline{)73}$	$9\overline{)16}$	$7\overline{)34}$	$9\overline{)88}$

In the examples below, some of the quotients are too large, some are too small, and some are right. Don't copy the examples. Just number your paper 7 to 9, with the letters *a*, *b*, *c*, *d*, and e, over five columns. If a quotient is too large, write L on your paper. If a quotient is too small, write S. If it is right, write R.

	a	*b*	*c*	*d*	e
7.	$\begin{array}{r}4\\ 8\overline{)30}\end{array}$	$\begin{array}{r}8\\ 4\overline{)35}\end{array}$	$\begin{array}{r}6\\ 7\overline{)51}\end{array}$	$\begin{array}{r}5\\ 9\overline{)42}\end{array}$	$\begin{array}{r}3\\ 6\overline{)21}\end{array}$
8.	$\begin{array}{r}4\\ 9\overline{)47}\end{array}$	$\begin{array}{r}7\\ 5\overline{)38}\end{array}$	$\begin{array}{r}6\\ 6\overline{)33}\end{array}$	$\begin{array}{r}8\\ 6\overline{)55}\end{array}$	$\begin{array}{r}4\\ 4\overline{)19}\end{array}$
9.	$\begin{array}{r}6\\ 7\overline{)43}\end{array}$	$\begin{array}{r}7\\ 9\overline{)75}\end{array}$	$\begin{array}{r}8\\ 3\overline{)22}\end{array}$	$\begin{array}{r}8\\ 7\overline{)60}\end{array}$	$\begin{array}{r}5\\ 8\overline{)50}\end{array}$

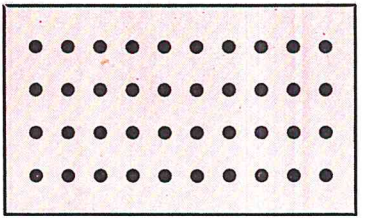
See if you can multiply numbers without writing the multiplier under the multiplicand. Copy each of the following examples in a line as it is written, and write the missing products. Or, if you prefer, just write the answers on your paper without copying the examples.

	a	*b*	*c*
10.	$2 \times 35 = ?$	$2 \times 67 = ?$	$3 \times 60 = ?$
11.	$4 \times 82 = ?$	$5 \times 83 = ?$	$7 \times 33 = ?$
12.	$6 \times 96 = ?$	$9 \times 48 = ?$	$7 \times 26 = ?$
13.	$8 \times 64 = ?$	$2 \times 29 = ?$	$5 \times 25 = ?$
14.	$6 \times 42 = ?$	$3 \times 39 = ?$	$7 \times 74 = ?$
15.	$4 \times 63 = ?$	$8 \times 92 = ?$	$5 \times 14 = ?$
16.	$9 \times 35 = ?$	$6 \times 57 = ?$	$4 \times 75 = ?$
17.	$3 \times 58 = ?$	$7 \times 85 = ?$	$5 \times 76 = ?$
18.	$9 \times 72 = ?$	$4 \times 49 = ?$	$8 \times 83 = ?$
19.	$6 \times 83 = ?$	$9 \times 96 = ?$	$8 \times 57 = ?$
20.	$3 \times 74 = ?$	$8 \times 75 = ?$	$7 \times 19 = ?$

In some of the following subtraction examples, you cannot subtract. Why? Copy all the examples. Cross out the examples in which you cannot subtract. Work the rest of the examples.

	a	*b*	*c*	*d*	*e*
21.	69 70	73 60	40 34	111 99	147 128
22.	796 747	216 216	239 276	540 486	880 892
23.	610 560	741 830	920 918	493 515	901 895

Dividing by Tens



1. The dots show 40 radishes Don pulled in his garden. He tied them in bunches, with 10 radishes in each bunch.

To find how many bunches Don had, you could count the number of groups of 10 dots each. How many 10's are there in 40? Or you could *subtract* 10's from 40: $40 - 10 = 30$, $30 - 10 = 20$, $20 - 10 = 10$, $10 - 10 = 0$. How many 10's did you subtract?

$$\begin{array}{r} 4 \\ 10\overline{)40} \\ \underline{40} \end{array}$$

Or you could *divide* 40 by 10. One ten goes into 4 tens 4 times. $40 \div 10 = ?$

2. Jill has 60 pansy plants to divide equally in baskets for sale. If she puts 20 plants in each basket, how many baskets will she need?

$$\begin{array}{r} 3 \\ 20\overline{)60} \\ \underline{60} \end{array}$$

To find out, divide 60 by 20. *Think:* 6 tens divided by 2 tens = 3. Where is the 3 written? What is the next step in the division? How many 20's are there in 60? How many baskets will Jill need?

Copy and divide. Think of tens divided by tens.

	a	*b*	*c*	*d*	*e*
3.	$10\overline{)60}$	$10\overline{)30}$	$10\overline{)80}$	$20\overline{)80}$	$20\overline{)40}$
4.	$20\overline{)140}$	$20\overline{)100}$	$20\overline{)180}$	$20\overline{)160}$	$20\overline{)120}$
5.	$30\overline{)120}$	$30\overline{)210}$	$30\overline{)270}$	$40\overline{)240}$	$50\overline{)150}$
6.	$80\overline{)160}$	$60\overline{)360}$	$50\overline{)200}$	$60\overline{)300}$	$90\overline{)360}$
7.	$70\overline{)420}$	$50\overline{)150}$	$80\overline{)240}$	$90\overline{)810}$	$60\overline{)120}$
8.	$70\overline{)350}$	$60\overline{)540}$	$50\overline{)400}$	$80\overline{)720}$	$80\overline{)480}$

Dividing by Two-Figure Numbers

1. Our car will go 21 miles on a gallon of gasoline. To find how many gallons we shall need to drive 105 miles, divide 105 by 21.

$$\begin{array}{r} 5 \\ 21\overline{)105} \\ \underline{105} \end{array}$$

Think: 21 is about 2 tens. 105 is about 10 tens. $10 \div 2 = 5$. This figure 2 is called the trial divisor. The figure 5 is called the trial quotient.

Write 5 over the 5 in 105. Multiply 5×21, and write the product under the 105. There is no remainder. Your trial quotient was the right quotient. How many gallons of gasoline will we need?

2. The school bus in which Dick goes to school went 256 miles in a week. The driver told Dick he had used 32 gallons of gasoline that week. To find how many miles the bus went per gallon, divide 256 by 32.

$$\begin{array}{r} 8 \\ 32\overline{)256} \\ \underline{256} \end{array}$$

Divide 25 tens by 3 tens. $25 \div 3 = 8$ with a remainder, so try 8 as a quotient. Tell where to write the 8 and how to finish the division. How many miles per gallon did the bus go?

Copy and divide. Think how many tens you are dividing each time, and about how many tens you are dividing by.

	a	*b*	*c*	*d*	*e*
3.	$21\overline{)42}$	$21\overline{)84}$	$11\overline{)77}$	$43\overline{)86}$	$34\overline{)68}$
4.	$31\overline{)248}$	$21\overline{)147}$	$51\overline{)204}$	$62\overline{)124}$	$41\overline{)123}$
5.	$52\overline{)156}$	$21\overline{)189}$	$61\overline{)427}$	$72\overline{)288}$	$83\overline{)249}$
6.	$92\overline{)368}$	$51\overline{)306}$	$93\overline{)186}$	$73\overline{)219}$	$41\overline{)369}$
7.	$22\overline{)154}$	$23\overline{)92}$	$35\overline{)70}$	$24\overline{)96}$	$29\overline{)58}$
8.	$53\overline{)318}$	$22\overline{)176}$	$43\overline{)301}$	$74\overline{)592}$	$39\overline{)117}$

Division With Remainders

$$\begin{array}{r} 4 \text{ r } 12 \\ 33\overline{)144} \\ \underline{132} \\ 12 \end{array}$$

1. There are 33 people at our class party. We have 144 small sandwiches. If we share them equally, how many sandwiches may each person have?

When you divide 144 by 33, think: How many times will 3 tens go into 14 tens? $14 \div 3 = 4$. Then 4 is your trial quotient. Multiply 33 by 4. $4 \times 33 = 132$. Subtract 132 from 144. How much is left? Is this remainder smaller than your divisor?

How many sandwiches may each person have? How many sandwiches will be left over?

Copy each example and divide. Be sure that the remainder is never larger than your divisor.

	a	*b*	*c*	*d*	*e*
2.	$30\overline{)96}$	$10\overline{)47}$	$20\overline{)82}$	$40\overline{)92}$	$20\overline{)50}$
3.	$40\overline{)126}$	$30\overline{)219}$	$50\overline{)314}$	$80\overline{)580}$	$60\overline{)505}$
4.	$23\overline{)49}$	$32\overline{)70}$	$41\overline{)96}$	$24\overline{)76}$	$11\overline{)69}$
5.	$41\overline{)374}$	$63\overline{)207}$	$52\overline{)110}$	$91\overline{)406}$	$72\overline{)245}$
6.	$34\overline{)175}$	$82\overline{)521}$	$53\overline{)295}$	$42\overline{)261}$	$95\overline{)500}$
7.	$61\overline{)499}$	$94\overline{)608}$	$47\overline{)239}$	$73\overline{)539}$	$84\overline{)380}$

Checking Division

1. Jerry has 75 cents. He wants to buy some picture puzzles costing 20 cents each. To find how many he can buy, divide 75 by 20.

Two tens will go into 7 tens 3 times. Multiply 20 by 3, and subtract the product from 75. How many puzzles can Jerry buy? How much money will he have left?

To check, multiply 3 × 20¢ (what Jerry will pay for the puzzles) and add 15¢ (the money he will have left). Does the sum equal the money he has now?

$$\begin{array}{r} 3 \text{ r } 15 \\ 20\overline{)75} \\ 60 \\ \hline 15 \end{array}$$

Check

$$\begin{array}{r} 20 \\ 3 \\ \hline 60 \\ 15 \\ \hline 75 \end{array}$$

Copy, divide, and check. Most of the examples have remainders.

	a	*b*	*c*	*d*	*e*
2.	$30\overline{)240}$	$20\overline{)140}$	$31\overline{)186}$	$42\overline{)294}$	$53\overline{)318}$
3.	$50\overline{)255}$	$30\overline{)178}$	$41\overline{)137}$	$63\overline{)342}$	$52\overline{)440}$
4.	$84\overline{)375}$	$75\overline{)402}$	$21\overline{)178}$	$43\overline{)395}$	$85\overline{)510}$
5.	$96\overline{)888}$	$74\overline{)558}$	$64\overline{)576}$	$94\overline{)602}$	$45\overline{)275}$
6.	$73\overline{)310}$	$67\overline{)231}$	$95\overline{)400}$	$87\overline{)783}$	$63\overline{)514}$

Multiply or Divide?

Before you work each problem, decide whether you should multiply or divide. After you have solved a problem, read it again and decide whether your answer is *reasonable.* Make sure you haven't used the wrong process.

1. Jerry collects stamps. He has 72 stamps to put in his trading album. If he puts 24 stamps on a page, how many pages will he fill?

2. We need 180 paper cups for our school party. We can buy 20 cups in a carton. How many cartons must we buy?

3. Mr. Preston's large car goes 13 miles on a gallon of gasoline. Last month he bought 91 gallons of gasoline for the car. How many miles did the car go last month?

4. If gasoline is 27 cents a gallon, how much should Mr. Preston pay for 9 gallons?

5. Mr. Lane bought 4 new tires for his car. He paid $96 in all for them. How much did each tire cost him?

6. Don and his father have 250 strawberry plants to set out. If they put 50 plants in a row, how many rows will they have?

7. Don found that a large basket of apples held 96 apples. A small basket held only 24 apples. How many times as many apples did the large basket hold?

8. Mrs. Lane wants to buy 15 boxes of strawberries to make jam. At 45 cents a box, how much must she pay for 15 boxes?

9. The school band has 500 handbills about its concert to distribute. If 10 boys agree to distribute the handbills, how many should each boy take?

10. Sam is selling 20-cent tickets for the school play. So far, he has taken in 80 cents. How many tickets must he have sold?

11. One week, Bob's hens laid 48 eggs. How many dozen eggs did they lay?

12. Another week, Bob sold 8 dozen eggs. He received $5.20 in all for them. How much a dozen did he get, on the average?

13. Larry's club bought 20 magazines at 10 cents a copy. What was the total cost?

14. Larry's club raises money by selling old magazines for 5 cents a copy. One month, the boys sold 40 copies of old magazines. How much money did they get?

15. Bob is charging 45 cents a pound for the chickens he sells. Mrs. Carter bought 15 pounds of chickens to cook for the church supper. How much money did Bob get for these chickens?

16. The Lanes used 8 gallons of gasoline to drive to the seashore for their vacation. The distance was 176 miles. How many miles did they get per gallon?

17. Nora wants to find how many words there are on each page of her book. There are 33 lines per page, with about 11 words on each line. About how many words per page is this?

18. Bill has 75 cents. He wants to buy some toy trucks costing 25 cents each. How many trucks can he buy?

19. Jean has saved 70 pennies. She wants to change them to dimes to put in her dime bank. How many dimes can she get in exchange for the pennies?

20. If an airplane flies 195 miles an hour on the average, how many miles will it fly in 15 hours?

How Well Can You Add?

You have just been doing a lot of dividing. While you are learning about division, you want to be sure you don't forget what you have learned about the other three processes. The examples on this page will help you keep up and improve your skills in addition.

Copy, add, and check.

	a	*b*	*c*	*d*	e
1.	5 9 7 3 8 5	7 6 7 6 9 5	35 72 24 40 17 53	18 59 65 38 80 44	56 47 64 8 56 35
2.	403 146 847	359 603 567	127 97 593	2489 2548 5180	8757 639 9178
3.	731 299 888 167	168 422 879 230	69 518 1206 70	8336 3011 6997 5906	6438 96 587 3382
4.	\$ .48 .68 .97 .95	\$ .47 .86 .50 .97	\$7.42 6.80 6.77 8.29	\$ .79 5.04 5.34 7.68	\$2.50 7.25 .75 6.93
5.	\$70.37 51.79 73.50 18.44	\$56.49 9.75 20.96 18.00	\$ 74.28 234.04 42.59 5.16	\$176.06 488.25 50.80 379.89	\$734.69 484.50 867.87 367.76

6. 45 + 178 + 29 + 8 + 93

7. 309 + 88 + 2902 + 677

8. \$7.49 + \$.96 + \$2.32 + \$8.00

9. \$13.47 + \$7.38 + \$4.53 + \$.47 + \$4.10

How Well Can You Subtract?

These examples will help you keep up your skills in subtraction.

Copy, subtract, and check.

	a	b	c	d	e
1.	93 64	150 67	109 34	763 459	602 376
2.	715 688	1465 770	3926 3259	8481 5809	7320 2821
3.	\$1.23 .75	\$9.40 5.90	\$10.07 6.88	\$35.72 17.34	\$50.00 21.35

	a	b	c
4.	147 — 69	1192 — 607	2180 — 832
5.	\$13.70 — \$8.09	\$1.25 — 36¢	\$5 — \$4.26

How Well Can You Multiply?

These examples will help you make sure of multiplication.

Copy, multiply, and check.

	a	b	c	d	e
1.	67 38	94 64	83 75	205 47	145 92
2.	386 261	495 358	670 579	902 369	890 780
3.	\$ .78 49	\$1.75 76	\$3.98 90	\$1.83 36	\$3.07 2 08

	a	b	c
4.	70 × 146	48 × 639	80 × 520
5.	25 × \$.92	140 × \$1.76	58 × \$4.18

Numbers You Do Not Need

In each of these problems, there is a number you do not use to solve the problem. Decide which numbers you need to solve the problem, and find the answer. See if you can work any of the problems as quickies.

1. Jean bought 4 cakes of soap for 15 cents a cake. She handed the clerk $1.00. How much did the 4 cakes of soap cost in all?

2. Sue had 24 apples. She gave 3 apples apiece to 6 girls. How many apples did she give away?

3. Larry has 35 cents. He wants to buy a magazine costing 15 cents and a puzzle costing 40 cents. What is the total cost of the magazine and the puzzle?

4. Dick has a board 80 inches long. He wants to cut off 3 pieces each 18 inches long. What is the total length of the 3 pieces?

5. Don picked 19 ears of corn from one row in his garden and 17 ears from another row. He sold the corn for 4 cents an ear. How many ears of corn did Don pick?

6. One morning we drove 78 miles. That afternoon we drove 89 miles. The whole trip took 5 hours. How many miles did we drive?

7. Linda weighs 75 pounds. Her brother weighs 96 pounds. Their father weighs 174 pounds. How much do Linda and her brother weigh together?

8. Our baseball team has played 5 games. In these games, we made the following numbers of runs: first game, 8; second, 0; third, 6; fourth, 14; fifth, 9. How many runs have we made in all?

9. Linda's father took her with him when he made a trip in an airplane. Their plane took off at 7 a.m. It flew 760 miles and landed at 11 a.m. How many hours did it fly?

10. Jean and her brother Tony are saving for a table radio costing $17.50. Tony has saved $7.28 and Jean has saved $6.75. How much have they saved together?

11. Eggs are worth 59 cents a dozen, and Bob has 48 eggs to sell. How many dozen eggs has Bob?

12. One Saturday morning, Sue made a large pan of fudge. She cut it into 5 rows with 12 pieces in each row. She gave away 15 pieces of the fudge. How many pieces of fudge did Sue make?

13. Allen bought three rolls of film costing 35 cents each. He gave the clerk a dollar and a quarter. How much did the films cost?

14. Tom had 196 inches of track for his electric train. Then he got 12 pieces of track for his birthday. Each piece was 11 inches long. How many inches of track did Tom get for his birthday?

15. Peggy bought 3 tennis balls costing 65 cents each, and a tennis racket costing $4.98. How much did she pay for the tennis balls?

16. Nine boys and 8 girls came to Ellen's party. Ellen's mother took all of them to the movies. The tickets cost 25¢ each. How many children were at the party? (Don't forget Ellen!)

17. Don's father is starting a new peach orchard. He has planted 8 rows of trees with 16 trees in each row. He still has 12 more trees to plant. How many trees has Don's father planted?

Two Problems in One

In each of these problems, two questions are asked. You must answer the first question before you can answer the second question. There really are two problems in each problem. Find both answers for each problem. Can you do any of the problems as quickies?

1. Don raised two watermelons. One weighed 35 pounds and the other weighed 40 pounds. What was the total weight of the two melons? He sold them for 3 cents a pound. How much did he get for the two melons?

2. Bill kept count of his father's golf score. His scores for the first 9 holes were 5, 4, 6, 3, 4, 5, 5, 5, and 6. What was his total score for the first 9 holes? How many strokes over 40 was this?

3. Jill picked 60 flowers. She tied them into bunches, with 10 flowers in each bunch. How many bunches did she have? She sold the flowers for 15 cents a bunch. How much did Jill get for all the flowers?

4. Ellen bought 18 favors for her party. They cost 5 cents each. How much did all the favors cost? Ellen gave the clerk a dollar bill. How much change did she get?

5. Sam's father took Sam and Bob fishing. Sam caught 9 fish, Bob caught 7, and Sam's father caught 20. How many fish did the two boys catch? How many more fish did Sam's father catch than the two boys together?

6. Dick made a table, which he sold for $12. He had spent $5.25 for the wood and other materials. How much more than his expenses did Dick get for the table? If it took him 9 hours to make the table, how much an hour did he get for his work?

7. Jim and Jerry earned $1.35 and 95 cents for cutting two lawns. How much did they earn in all? The boys agreed to divide the money equally. How much did each boy get?

8. Dave counted 32 passengers in the bus. Then 7 people got off the bus. How many were left in the bus? At the next stop, 11 more people got on. How many passengers were there in the bus then?

9. Bob sold 6 chickens weighing about 3 pounds each. How many pounds did the 6 chickens weigh? Bob got 50 cents a pound for them. How much did he receive for all the chickens?

10. Ann got a Dutch doll for her birthday. It came by mail from a city store. On the package were three 8-cent stamps and a 6-cent stamp. How much did the 8-cent stamps cost? How much was the total postage on the package?

11. Jean has gone over to Ann's house to play. She promised her mother she would come home in 2 hours. How many minutes was this? Jean has already been at Ann's house 55 minutes. How much longer may she stay?

12. Jean and her brother Tony went on a 1050-mile trip with their father. The first day, they drove 386 miles. The second day, they drove 348 miles. How many miles did they drive in these two days? How many miles did they still have to drive?

13. Mrs. Lane spent 56 cents for apples, 75 cents for oranges, and $1.09 for meat. How much did she spend for fruit? How much more did she spend for fruit than for meat?

14. On a three-day trip, we spent $8.40 for gasoline. How much did we spend for gasoline each day on the average? Our other expenses were $7.60 a day. How much did our trip cost for each day?

Finding the Hidden Question

1. Jean's family gave her $10 for her birthday. Jean bought two pictures for her room. One cost $4.35 and the other cost $2.90. How much of her birthday money did Jean have left?

In this problem, you must answer *two* questions. The first question is hidden in the problem. It is, "How much did both pictures cost?" You must answer this hidden question before you can answer the written question.

Before you work each of the following problems, find the hidden question. Then work the two steps and write the second answer on your paper.

2. Sam has 95 cents. He wants to buy a fishing pole that costs 75 cents and a line that costs 48 cents. How much money does Sam still need?

3. Don has 13 tomato plants in one row of his garden and 9 plants in another row. If each plant gives an average of 12 tomatoes, how many tomatoes will Don get?

4. Bob sold two chickens, weighing 4 pounds and 3 pounds, for 48 cents a pound. How much did he receive in all?

5. Sally is collecting coupons from grocery packages to get a Christmas present for her mother. It takes 134 coupons to get a silver soup ladle. Sally had collected 86 coupons. Then Ann gave her 25 coupons. How many coupons does Sally still need for the soup ladle?

6. When a new 5-cent stamp came out, 6 boys in Jerry's stamp club asked Jerry to buy 4 stamps for each of them at the post office. How much did all the stamps cost?

7. A kind of soap that Mrs. Lane likes is on sale at a special price of 3 cakes for 38 cents. The regular price of this soap is 15 cents a cake. How much will Mrs. Lane save if she buys 3 cakes at the special price?

8. We bought 2 pounds of hot dogs for a hot dog roast. The hot dogs cost 48 cents a pound. If 8 people shared the cost, how much was each person's share?

9. On a fishing trip, Sam caught 8 fish, Bob caught 9 fish, Don caught 9 fish, and Don's friend Ben caught 6. The boys shared the fish equally. How many fish did each boy get?

10. Dave weighs 99 pounds. His sister weighs 77 pounds. Their mother weighs 128 pounds. How much more than their mother do Dave and his sister together weigh?

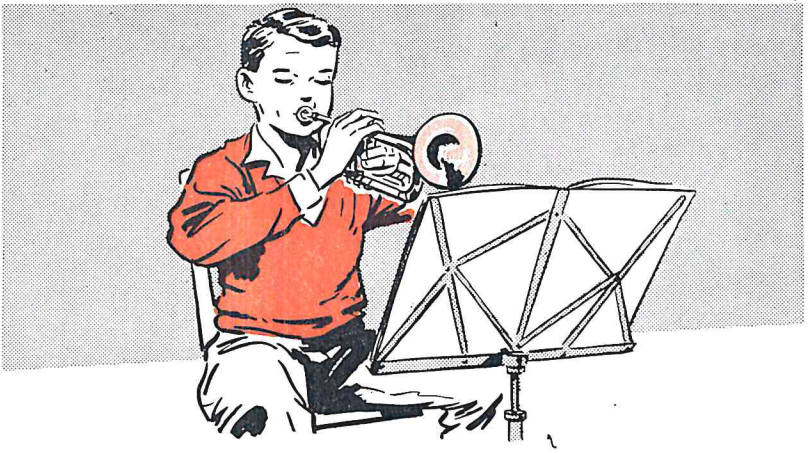
11. Jean had 39 pennies. Her uncle gave her 11 more pennies. Jean wants to change her pennies into nickels for her nickel bank. How many nickels will she get?

12. Jill picked 43 roses this morning. She kept 19 of them to make a bouquet, and wants to tie the rest in three equal bunches. How many roses should she put in each bunch?

13. Ann saves money by putting quarters in her bank. She has 14 quarters. How much more money does she need to buy a $6.25 doll for her doll collection?

Pages 278 and 279 provide enrichment material which can be used after this page.

Can You Find the Average?



1. Joe practices on his trumpet every day. He keeps a record of how many minutes he practices. In four days he has practiced 25 minutes, 40 minutes, 18 minutes, and 17 minutes. How many minutes a day, on the *average,* has he practiced?

To find the average of several things, first *add* to find the total. Then *divide* the total by the number of things. In this problem, what is the total? What is the average? How might knowing the average time he has practiced be useful to Joe?

2. Bob's hens laid 9 eggs on Monday, 14 eggs on Tuesday, and 13 eggs on Wednesday. How many eggs a day did they lay, on the average?

3. In the five school days this week, Ann spent for her lunches 35 cents, 28 cents, 30 cents, 29 cents, and 13 cents. Find the average cost of her lunches.

4. Nora got three books for her birthday. One book had 228 pages, one had 193 pages, and one had 206 pages. What was the average number of pages per book?

5. Ann bought 4 Christmas presents for her family. She paid 95 cents for one present, $2.50 for another, $1.75 for another, and $2 for the fourth. How much, on the average, did Ann pay per present?

6. Joe is 56 inches tall, Dave is 63 inches tall, and Larry is 55 inches tall. What is their average height? How many inches above their average height is Dave?

7. The basketball team in Bill's school has played four games. They scored 27 points in their first game, 44 points in the second game, 32 in the third, and 53 in the fourth. How many points did they average per game? How many points above the average did they score in the fourth game?

8. On a three-day trip, the Lanes drove 385 miles the first day, 366 miles the second day, and 408 miles the third day. How many miles a day did they average?

9. Bob sold four chickens for $1.75, 97 cents, $2.00, and $1.80. Find the average price per chicken.

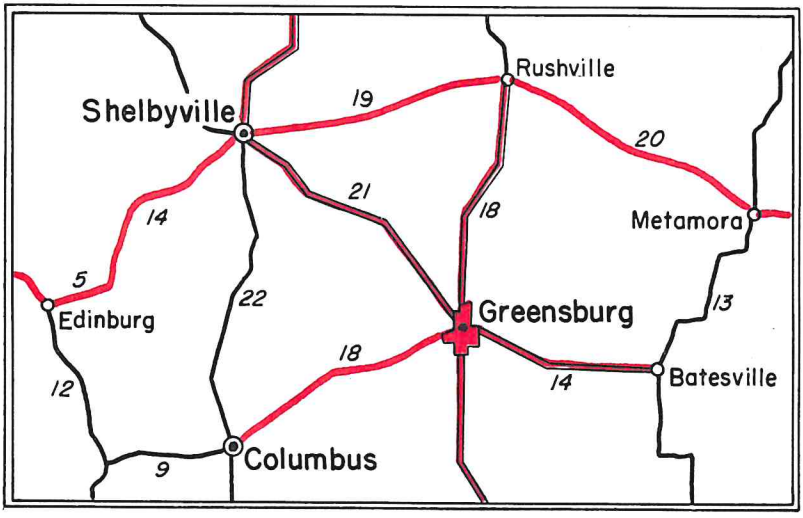
10. At noon Monday, the thermometer read 46°, on Tuesday it was 37°, on Wednesday 21°, on Thursday 9°, and on Friday 17°. What was the average noon temperature that school week?

11. One week last summer, Sue helped her mother can tomatoes. They canned 17 jars of tomatoes on Monday, 31 jars on Thursday, and 9 jars on Saturday. How many jars did they average for the three days? How many jars less than the average did they can on Saturday?

12. Some of the boys in Jerry's stamp club counted their United States stamps. Jerry had 150 stamps, Allen 93, and Tom 108. What was the average number?

Pages 280 and 281 provide enrichment material which can be used after this page.

Using a Road Map



Here is part of a road map. The numbers show the number of miles between the towns. From the road map, find the answers to the following questions.

1. How many miles is it from Edinburg to Shelbyville? From Edinburg to Columbus?

2. Mr. Lane had to drive from Shelbyville through Edinburg to Columbus. How many miles did he go?

3. How far is it from Rushville to Edinburg by way of Shelbyville?

4. How much farther is it from Rushville to Batesville through Metamora than through Greensburg?

5. How much shorter is it from Rushville to Columbus if you go through Greensburg than if you go through Shelbyville and Edinburg?

6. From Shelbyville to Metamora is how many miles by the shortest route?

Using a Mileage Table

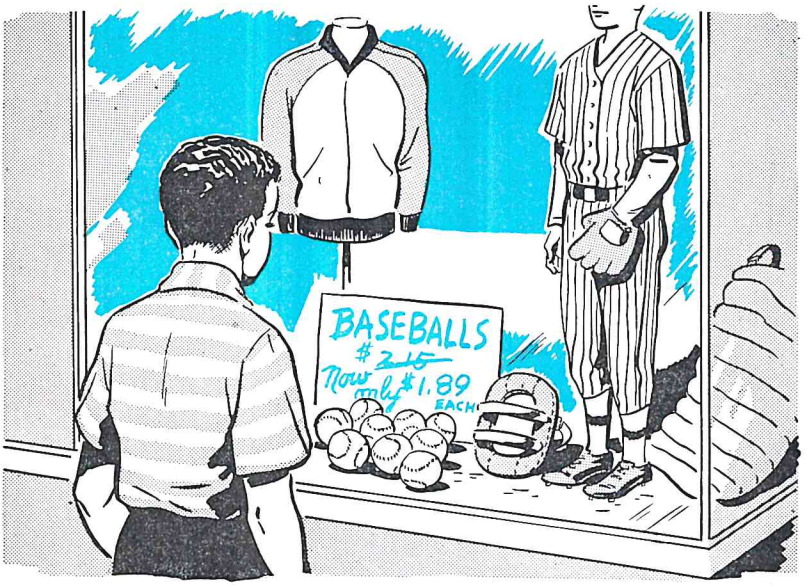
	Alton Lake	Buena Vista	Cartaret	Demarest	Elberta	Fenton Falls	Great Rapids
Alton Lake		57	124	40	89	160	16
Buena Vista	57		96	108	35	63	42
Cartaret	124	96		82	116	70	81
Demarest	40	108	82		77	130	48
Elberta	89	35	116	77		111	54
Fenton Falls	160	63	70	130	111		79
Great Rapids	16	42	81	48	54	79	

Here is part of a mileage table on the back of a road map. It shows the number of miles between different towns on the map. From Cartaret to Elberta is 116 miles; from Elberta to Cartaret is also 116 miles.

Use the table to find the number of miles from:

1. Alton Lake to Buena Vista
2. Alton Lake to Fenton Falls
3. Buena Vista to Cartaret
4. Buena Vista to Great Rapids
5. Cartaret to Alton Lake
6. Cartaret to Demarest
7. Demarest to Fenton Falls
8. Fenton Falls to Elberta
9. Great Rapids to Fenton Falls

Two-Step Problems at the Store



1. Late in the summer, Bill saw that a sporting goods store had reduced the price of baseballs from $2.15 to $1.89. Bill bought 4 baseballs for his team. How much did he save in all?

2. Sally's mother sent her to the store with a dollar to buy 10 pounds of sugar. If the sugar cost 9 cents a pound, how much change did Sally get?

3. Ann bought a bracelet for 98 cents and a necklace for $2.25. She paid for them with a five-dollar bill. How much change did she get?

4. Jean bought 8 colored pencils for 12 cents each and a scrapbook costing 75 cents. How much did she spend in all?

5. Tickets to the circus cost $1.25 each. A reserved seat costs 50 cents extra. How much must we pay for five tickets with reserved seats?

6. Tom wants a new engine costing $6.48 for his electric train, and 18 pieces of track at 20 cents for each piece. How much must he pay for both the engine and track?

7. Jean's brother Tony bought three neckties at 75 cents apiece and a pair of shoes for $6.50. How much more did he pay for the shoes than for the three neckties?

8. Jerry's father told Jerry he had just bought a television set. He paid $100 down and was to pay the rest in 9 payments of $21 each. How much did the set cost in all?

9. Mr. Lane needs four new tires and tubes for his car. Each tire costs $14.36 and each tube costs $6.79. How much must Mr. Lane pay for all his tires and tubes? (There are two ways of solving this problem. Can you work it the shorter way?)

10. Sally paid $1.50 for a melon and 3 boxes of strawberries. She remembered that the melon had cost 45 cents and she wanted to find out how much the strawberries had cost per box. How much a box had the berries cost?

11. Mrs. Lane wants to buy 3 spring chickens weighing 2 pounds each. The price is 47 cents a pound. How much will the 3 chickens cost her?

12. Jerry's father bought 3 stamps for his collection. One stamp cost 75 cents, one cost $1.20, and the third cost 60 cents. What was the average cost of the stamps?

13. Jean wants a handbag. At a special sale, a store is selling handbags at "$\frac{1}{3}$ off"—that is, the regular price is being reduced one third. How much must Jean pay for a handbag which had been priced at $4.98?

14. Allen needs 2 new shirts. At a sale, shirts which had been priced $2.76 are being sold at "$\frac{1}{4}$ off." How much will Allen save by buying 2 shirts at the reduced price?

Keeping Records

Sally helps her mother keep a record of the money spent for food in their family. Here is their record for three weeks.

	Milk and Eggs	*Groceries*	*Meat*
First Week	$5.48	$15.74	$8.17
Second Week	4.28	17.17	4.96
Third Week	5.02	14.43	9.21

1. How much did all their food cost the first week?

2. How much did they pay for food the second week?

3. What was the cost of their food for the third week?

4. Find the cost of milk and eggs for all three weeks.

5. Find the cost of the groceries for all three weeks.

6. Find the cost of meat for three weeks.

7. Find the total amount they spent for all their food in 3 weeks by adding what they spent the first week, the second week, and the third week (Problems 1, 2, and 3).

8. Now find the cost of all their food for 3 weeks by adding the total amounts spent for milk and eggs, for groceries, and for meat (Problems 4, 5, and 6). Are both sums the same?

Use the answers to Problems 1 to 8 on page 116 in working Problems 9 to 14.

9. How much more did Sally's family spend for food the first week than the second week?

10. In the 3 weeks, how much more did they spend for meat than for eggs and milk?

11. How much less did they spend for meat than for groceries?

12. On the average, how much a week did they spend for groceries?

13. How much a week did their meat cost, on the average?

14. There are 4 persons in Sally's family. What was the average cost of all the food for one person for three weeks?

15. On Monday one week, Mrs. Lane spent \$1.50 for milk and eggs. On Tuesday, she spent \$1.25 for meat, and \$2.50 for groceries. On Wednesday, she spent \$1.02 for milk and \$2.00 for meat. On Thursday, she spent \$3.50 for groceries. On Friday, she spent \$1.85 for milk and eggs, 98¢ for meat, and \$2.05 for groceries. On Saturday, she spent \$4.84 for groceries and \$3.50 for meat.

On your paper, make a record of how much Mrs. Lane spent each day. Your record will start like this:

	Milk and Eggs	Groceries	Meat
Monday	\$1.50	—	—

16. How much did she spend that week for milk and eggs?

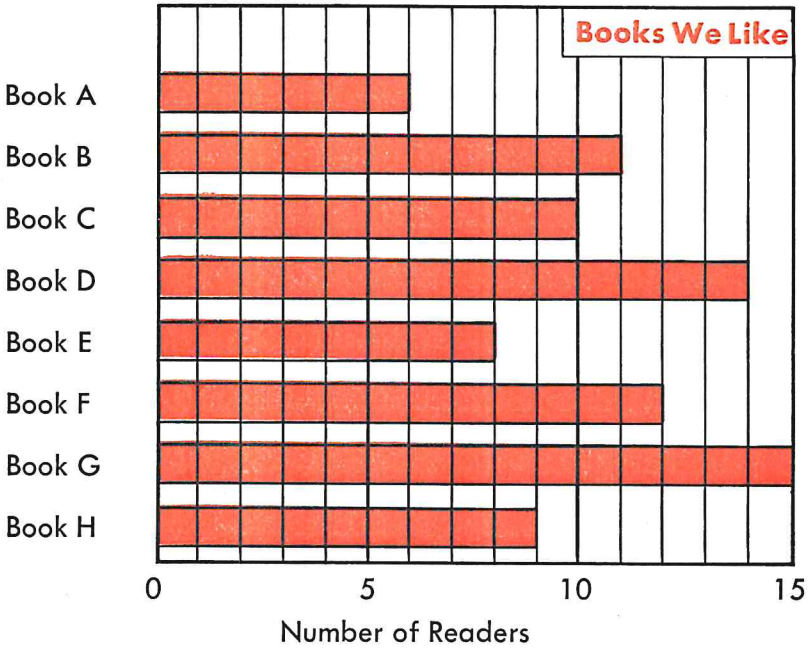
17. How much did she spend in all for groceries?

18. How much did she spend for meat?

19. How much did she spend for all the food?

Pages 282 and 283 provide enrichment material which can be used after this page.

Using Bar Graphs



Nora made this bar graph to show how popular some of the books in her classroom library are. At the side of the graph, she wrote the names of the 8 books the boys and girls in the class liked best. At the bottom of the chart she put a number scale. The scale ran from 0 to 15. Beside the name of each book, Nora drew a bar to show how many people in the class had read it.

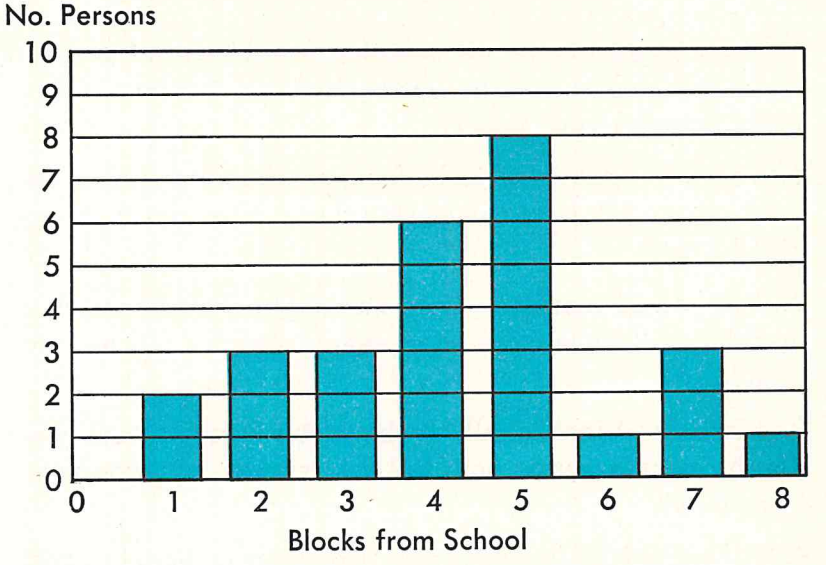
1. Can you read Nora's graph? Tell how many people have read and liked each book.

2. Which book was most popular?

3. Which book was least popular?

4. How many of the books were read by 10 or more of the boys and girls?

Distance Our Class Lives from School



Tom made a graph to show how far the boys and girls in his class lived from school. The numbers up the side of the graph show numbers of people. The numbers underneath the graph show the number of blocks they live from school.

5. The graph shows that 2 pupils in the class live only 1 block from school. How many pupils live 2 blocks away? 3 blocks away? 5 blocks away? 7 blocks away?

6. How many pupils live 5 blocks away or less?

7. How many pupils live more than 5 blocks away?

8. Last year, Bob kept a record of the number of times it snowed. It snowed 2 times in November, 5 times in December, 7 in January, 6 in February, and 4 in March.

Turn these facts into a bar graph like the one on page 118. Write the months at the left. Let the numbers underneath the graph show the number of times it snowed. What title will you write above your graph?

Two-Step Quickies

These problems are all two-step problems, but you can find the answers in your head. Just tell the answers, or write them on your paper.

1. Peggy bought some jacks for 5 cents and a rubber ball for 3 cents. She gave the clerk a dime. How much change did she get?

2. Bill had 20 marbles. Then he bought 5 cents' worth of marbles at 2 for a cent. How many marbles did he have then?

3. Linda is 54 inches tall. If she grows 2 inches each year for the next 3 years, how tall will she be in three years from now?

4. Jill picked 24 flowers. She tied them in bunches with 8 flowers in each bunch, and sold the bunches for 10 cents apiece. How much did she get for all the flowers?

5. Sue made 36 pieces of fudge. She put 24 pieces in a box for her mother's birthday present and shared the rest equally with 3 of her friends. How many pieces of fudge did each of the 4 girls have?

6. Nora has read 6 pages of her book in 24 minutes. At this rate, how many minutes will it take her to read the next 8 pages?

7. In three games, Bill's baseball team made 4 runs, 0 runs, and 8 runs. How many runs per game did they average?

8. Don sold 3 cucumbers for 5 cents each and a bunch of beets for 10 cents. How much money did he get in all?

9. Sue made 18 cookies. She gave 2 cookies each to Sam, Bob, and Don. How many cookies did she have left?

Can You Find Fractions of Measures?

Do you remember how to find fractions of measures?

Can you find half of a measure?

1. How many ounces equal one half pound?
2. How many minutes are there in $\frac{1}{2}$ hour?
3. How many quarts in $\frac{1}{2}$ gallon?
4. How many months in $\frac{1}{2}$ year?
5. How many inches in $\frac{1}{2}$ yard?

Can you find a fourth of a measure?

6. How many minutes are a quarter of an hour?
7. How many eggs equal $\frac{1}{4}$ dozen eggs?
8. A quarter of a yard is how many inches?
9. A quarter of a gallon is how many pints?
10. How many pounds equal $\frac{1}{4}$ ton?

Can you find a third of a measure?

11. How many inches are there in $\frac{1}{3}$ foot?
12. How many seconds make $\frac{1}{3}$ minute?

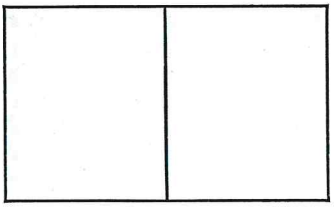
Can you find three fourths of a measure?

13. How many ounces equal $\frac{3}{4}$ pound?
14. How many months equal $\frac{3}{4}$ year?
15. How many inches equal $\frac{3}{4}$ yard?
16. How many minutes equal $\frac{3}{4}$ hour?
17. How many lemons equal $\frac{3}{4}$ dozen lemons?
18. How many pounds make $\frac{3}{4}$ ton?

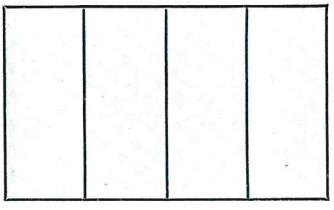
Can you find two thirds of a measure?

19. How many oranges equal $\frac{2}{3}$ dozen?
20. How many minutes equal $\frac{2}{3}$ hour?

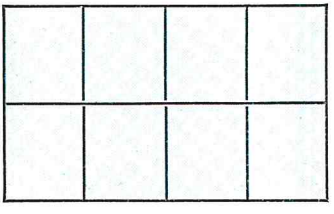
Understanding Fractions



I



II



III

1. The three rectangles at the left are all the same size, but they are divided into different fractional parts.

Rectangle I has been divided into 2 equal parts, or *halves*. Into what fractions has Rectangle II been divided? What fraction is each part of Rectangle III?

The three rectangles will help you to answer the following questions.

2. Look at Rectangle I. What fraction must be added to $\frac{1}{2}$ to make 1 whole? $\frac{1}{2} + ? = 1$.

3. Look at Rectangle II. What fraction must be added to $\frac{3}{4}$ to make 1? $\frac{3}{4} + ? = 1$. $\frac{1}{4} + ? = 1$.

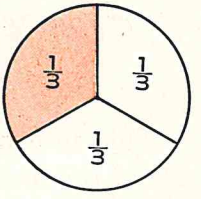
4. Look at Rectangle III. How many 8ths must be added to $\frac{1}{8}$ to make 1? What fraction must be added to $\frac{3}{8}$ to make 1? What fraction must be added to $\frac{5}{8}$ to make 1? What fraction and $\frac{7}{8}$ make 1?

$\frac{1}{8} + ? = 1$ $\quad \frac{7}{8} + ? = 1$ $\quad \frac{3}{8} + ? = 1$ $\quad \frac{5}{8} + ? = 1$

Can you change fractions to other forms? Look at the rectangles, and finish writing these fractions.

	a	*b*	*c*	*d*
5.	$\frac{1}{2} = \frac{?}{4}$	$\frac{1}{4} = \frac{?}{8}$	$\frac{1}{2} = \frac{?}{8}$	$\frac{3}{4} = \frac{?}{8}$
6.	$\frac{2}{4} = \frac{?}{2}$	$\frac{2}{8} = \frac{?}{4}$	$\frac{4}{8} = \frac{?}{2}$	$\frac{6}{8} = \frac{?}{4}$

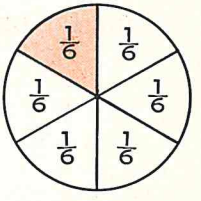
Do you understand thirds and sixths? The circles at the right will help you remember them.



IV

7. Look at Circle IV. How many thirds must be added to $\frac{1}{3}$ to make 1 whole? $\frac{1}{3} + ? = 1$ $\frac{2}{3} + ? = 1$

8. Look at Circle V. How many 6ths must be added to $\frac{1}{6}$ to make 1? $\frac{1}{6} + ? = 1$. What fraction must be added to $\frac{5}{6}$ to make 1? $\frac{5}{6} + ? = 1$



V

9. How many 6ths are there in $\frac{1}{3}$? $\frac{1}{3} = \frac{?}{6}$ Two 6ths are how many 3rds? $\frac{2}{6} = \frac{?}{3}$

10. How many 6ths are there in $\frac{2}{3}$? $\frac{2}{3} = \frac{?}{6}$. Four sixths are how many 3rds? $\frac{4}{6} = \frac{?}{3}$

11. How many sixths are there in half the circle? $\frac{1}{2} = \frac{?}{6}$

Do you remember how to compare fractions? The rectangles on page 122 will help you to answer these questions.

12. Which fraction is larger, $\frac{1}{4}$ or $\frac{1}{2}$? $\frac{1}{4}$ or $\frac{1}{8}$?

13. Which fraction is largest, $\frac{1}{8}$, $\frac{1}{4}$, or $\frac{1}{2}$?

14. Is $\frac{3}{8}$ larger or smaller than $\frac{1}{4}$?

15. Which is larger, $\frac{7}{8}$ or $\frac{5}{8}$? $\frac{1}{2}$ or $\frac{5}{8}$?

16. Which is smaller, $\frac{3}{4}$ or $\frac{7}{8}$? $\frac{3}{4}$ or $\frac{5}{8}$?

The circles above will help you to answer the following questions.

17. Which fraction is larger, $\frac{1}{2}$ or $\frac{1}{3}$? $\frac{1}{3}$ or $\frac{1}{6}$?

18. Which fraction is largest, $\frac{1}{2}$, $\frac{1}{3}$, or $\frac{1}{6}$?

19. Which is smaller, $\frac{1}{3}$ or $\frac{2}{3}$? $\frac{1}{2}$ or $\frac{5}{6}$?

20. Is $\frac{2}{3}$ larger or smaller than $\frac{5}{6}$?

21. Since $\frac{1}{2} = \frac{3}{6}$ and $\frac{1}{2} = \frac{2}{4}$, which is larger, $\frac{1}{6}$ or $\frac{1}{4}$?

Can You Work With Numbers?

Diagnostic Check Test 2A

This test will show you how much you have learned about the four processes. Copy the examples on this page, work them carefully, and check all your work.

Find the products.

	a	*b*	*c*	*d*	e
1.	907 36	$6.85 40	418 237	732 509	402 164

Find the quotients.

2.	$21\overline{)168}$	$40\overline{)200}$	$82\overline{)574}$	$51\overline{)309}$	$9\overline{)\$30.60}$

Find the remainders.

3.	152 74	718 325	816 207	8153 7768	3207 609
4.	$1.36 .87	$20.42 19.69	$60.00 48.65	$126.75 80.98	$100.00 73.43

Find the sums.

5.	69 18 74 36 47 50	238 606 986 689 470 227	3075 638 459 62 1487	$ 8.40 3.95 10.15 .78 6.59 28.00	$316.57 47.50 4.98 785.03 59.84

Do what the signs tell you to do.

	a	*b*	*c*
6.	58×196	$112 - 45$	$79 + 329$
7.	$608 \div 72$	207×409	$\$24.54 \div 6$
8.	$\$14.67 + \$9.96$	$95 \times \$5.80$	$\$28 - \$8.59$

Do You Understand Numbers?

Diagnostic Check Test 2B

This test will show you how much you understand about what numbers mean and what they do.

1. Write the number that means 1 million, 706 thousands, no hundreds, 8 tens, 5 ones.

2. Write six dollars and six cents in figures.

3. Write the largest 4-figure number you can.

4. What is the smallest 4-figure number you can write using the figures 7, 0, 1, 5?

5. In the number 8259, how much is the figure 2 worth?

6. Write 1037, 289, and 301 in the order of their value, the smallest first.

7. Find $389+389+389+389+389+389+389$ in a short way.

8. Only one of the three following numbers can be exactly divided by 9. Which is it? 8476, 967, or 6003.

9. Which two numbers do you multiply to check the example $406 \div 58 = 7$?

10. What fraction must be added to $\frac{3}{8}$ to make 1?

11. Write $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{1}{8}$ in the order of their value, the largest first.

12. Is $\frac{3}{4}$ dozen more or less than $\frac{2}{3}$ dozen?

13. How many sixths are there in $\frac{1}{2}$?

14. How many eighths make $\frac{3}{4}$?

15. Which fraction is smaller, $\frac{3}{8}$ or $\frac{1}{2}$?

16. Divide 30 by 7, writing the remainder as a fraction.

17. Which is more, $\frac{1}{2}$ pound or 6 ounces?

18. Is $\frac{1}{4}$ dozen more, or less, than 4?

19. How many eggs equal $\frac{3}{4}$ dozen eggs?

20. What measure equals 2000 lb.?

Can You Use Arithmetic?

Diagnostic Check Test 2C

The test on these two pages will show you how well you can use numbers in problems. Read the problems carefully, decide what processes you should use to solve the problems, then find the answers. Be sure all your answers are reasonable.

1. Bill earned $28.40 last summer. He spent $18.75 and saved the rest. How much did he save?

2. Jerry's mother asked him to buy 75 three-cent stamps for her at the post office. How much money did he need to pay for them?

3. Dick wants a saw costing $3.98 and a tool chest costing $10.25. Find the total cost.

4. Our car went 280 miles on 14 gallons of gasoline. How many miles did it go on one gallon, on the average?

5. Tom read the thermometer outdoors one winter day. It said 14°. How many degrees below freezing was that?

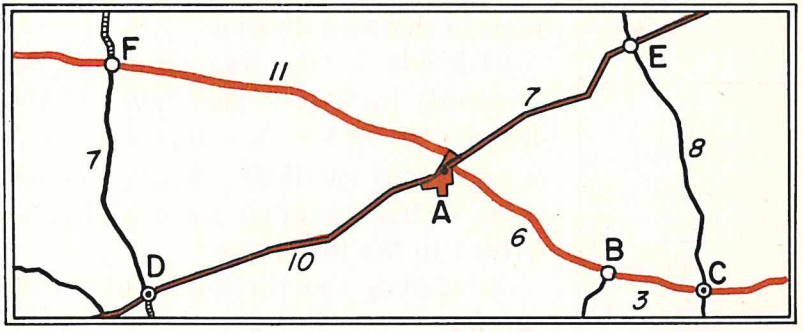
6. Sally's bus was supposed to come at 5 minutes before 9. It did not come until 10 minutes past 9. How many minutes late was the bus?

7. Bob weighs 89 pounds, Sue weighs 75 pounds, Mr. Gray weighs 180 pounds, and Mrs. Gray weighs 128 pounds. What is the average weight of the members of the Gray family? How many pounds below the average is Bob?

8. One day last summer, Sue spent 65 cents for lemons and sugar to make lemonade to sell at the road stand. She sold 16 glasses, for 8 cents a glass. How much money did she make?

9. Bill and Joe are saving money to buy a $6 football. Bill has saved $1.80 and Joe has saved $2.95. How much more money do the boys need?

10. On Friday, Don picked 42 ears of corn in his garden. On Saturday, he picked 78 ears. How many dozen ears of corn did he pick in the two days?



Here is a part of a road map. The towns on the map are marked A, B, C, D, E, and F. The numbers show the number of miles between the towns.

11. How many miles farther is it from C to F than from E to D?

12. How many miles farther is it from A to C going through E than going through B?

Bob is selling small eggs for 39 cents a dozen, medium sized eggs for 63 cents a dozen, and large eggs for 75 cents a dozen.

13. How much more will 2 dozen large eggs cost than 2 dozen small eggs?

14. What is the total cost of 2 dozen medium sized eggs and 1 dozen large eggs?

15. How much change from a dollar should Bob give a customer who bought 2 dozen small eggs?

Division With Two-Figure Quotients

$$\begin{array}{r} 13 \\ 25\overline{)325} \\ 25 \\ \hline 75 \\ 75 \\ \hline \end{array}$$

Check

$$\begin{array}{r} 13 \\ 25 \\ \hline 65 \\ 26 \\ \hline 325 \end{array}$$

1. Nora's new book has 325 pages. Nora can read 25 pages an hour. Find how many hours it will take her to read the book by dividing 325 by 25.

First, divide 32 by 25. There are four steps in this first division.

(1) Divide 3 (the first figure of the dividend) by 2 (the first figure of the divisor). $3 \div 2 = 1$, with 1 over, so 1 is your trial quotient. Since you are going to have another quotient figure, write 1 in the tens place.

(2) Multiply the divisor by the trial quotient. $1 \times 25 = 25$.

(3) Subtract. $32 - 25 = 7$.

(4) Bring down. Write 5 after 7.

Explain the 2 steps in finding the second figure of the quotient. Where is the 3 written? How is the work checked?

How many hours will it take Nora to read her book?

Copy, divide, and check.

	a	*b*	*c*	*d*
2.	$12\overline{)144}$	$24\overline{)288}$	$11\overline{)198}$	$32\overline{)384}$
3.	$21\overline{)294}$	$32\overline{)672}$	$24\overline{)552}$	$23\overline{)322}$
4.	$32\overline{)800}$	$44\overline{)924}$	$22\overline{)946}$	$33\overline{)726}$
5.	$46\overline{)966}$	$24\overline{)768}$	$39\overline{)819}$	$47\overline{)987}$
6.	$25\overline{)575}$	$62\overline{)868}$	$37\overline{)851}$	$32\overline{)736}$
7.	$53\overline{)689}$	$43\overline{)946}$	$74\overline{)888}$	$31\overline{)837}$

Dividing Four-Figure Numbers

1. The Lanes are planning to take a 1190-mile vacation trip. Mr. Lane thinks they will average about 35 miles an hour. How many hours will they spend in driving?

The division is shown at the right. $11 \div 3 = 3$. Since 3×35 will give a three-figure product, the 3 must be written in the tens place, above the 9. Explain the rest of the division, and check.

```
   34
35)1190
  105
  ---
  140
  140
  ---
```

Copy, divide, and check.

	a	*b*	*c*	*d*
2.	$34\overline{)1768}$	$36\overline{)1152}$	$43\overline{)1118}$	$38\overline{)1178}$
3.	$65\overline{)2795}$	$42\overline{)1470}$	$74\overline{)3034}$	$83\overline{)2158}$
4.	$54\overline{)1890}$	$94\overline{)5828}$	$72\overline{)3096}$	$64\overline{)4672}$
5.	$83\overline{)7968}$	$46\overline{)2392}$	$94\overline{)3196}$	$73\overline{)3942}$
6.	$86\overline{)3612}$	$43\overline{)1849}$	$82\overline{)5248}$	$77\overline{)4081}$
7.	$54\overline{)1404}$	$47\overline{)1504}$	$57\overline{)1368}$	$61\overline{)5002}$

Quotients Ending in Zero

$$\begin{array}{r} 50 \\ 23\overline{)1150} \\ 115 \\ \hline 0 \end{array}$$

Check

$$\begin{array}{r} 50 \\ 23 \\ \hline 150 \\ 100 \\ \hline 1150 \end{array}$$

1. A fast train went 1150 miles in 23 hours. To find how many miles an hour it averaged, divide 1150 by 23.

The work is shown at the left. Where is the 5 in the quotient written? Why? There must be a figure in the ones place, over the 0 in the dividend. $0 \div 23 = 0$. How many miles an hour did the train average?

Copy, divide, and check.

	a	*b*	*c*	*d*
2.	$12\overline{)480}$	$12\overline{)360}$	$23\overline{)920}$	$26\overline{)520}$
3.	$24\overline{)720}$	$32\overline{)1280}$	$43\overline{)1720}$	$43\overline{)2580}$
4.	$62\overline{)4960}$	$54\overline{)3780}$	$75\overline{)3000}$	$44\overline{)2200}$
5.	$30\overline{)1200}$	$70\overline{)4200}$	$92\overline{)4600}$	$87\overline{)6960}$
6.	$22\overline{)1100}$	$84\overline{)5880}$	$40\overline{)2000}$	$76\overline{)3800}$
7.	$90\overline{)6300}$	$32\overline{)2880}$	$67\overline{)4690}$	$50\overline{)3000}$

Division With a Remainder

There are final remainders in the following examples. When you check, remember to add the remainder.

1.	$64\overline{)1932}$	$34\overline{)2046}$	$43\overline{)3036}$	$64\overline{)3240}$
2.	$95\overline{)3850}$	$66\overline{)1667}$	$52\overline{)4179}$	$85\overline{)5150}$
3.	$76\overline{)6120}$	$57\overline{)1944}$	$73\overline{)1900}$	$94\overline{)2200}$
4.	$83\overline{)4410}$	$62\overline{)5586}$	$96\overline{)8680}$	$85\overline{)3763}$
5.	$22\overline{)1330}$	$32\overline{)2568}$	$54\overline{)2848}$	$43\overline{)2690}$

Making Up Two-Step Problems

Can you make up two-step problems for your classmates to solve? Some suggestions for problems are given on this page. Write a problem for each suggestion below. Work your problems yourself to be sure they are sensible problems. Then exchange problems with a classmate.

1. Make up a two-step problem about buying two things at the store and the change you should get.

2. Make up a two-step problem about the number of miles your family drove in the first hour, the second hour, and the third hour of a trip, and the average number of miles an hour they drove.

3. Make up a two-step problem about buying 3 boxes of strawberries and a melon.

4. Make up a two-step problem about making some fudge and giving 4 pieces of your fudge to each of 3 friends.

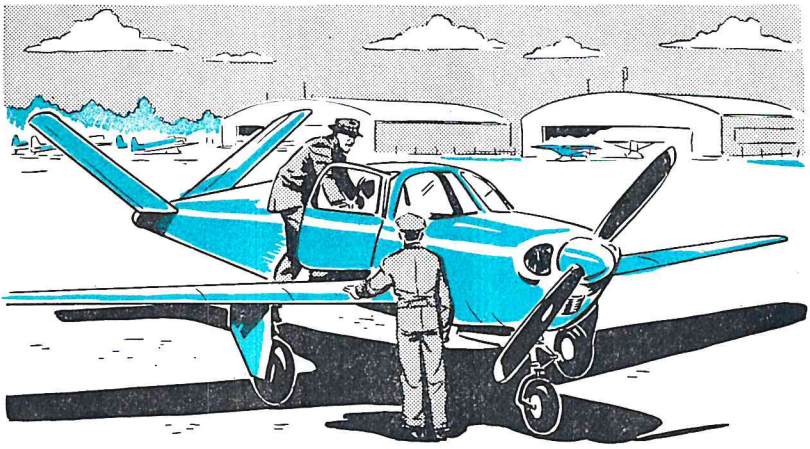
5. Make up a problem about how many marbles you have and how many marbles one of your friends has, and how many marbles each of you will have if you divide them equally between you.

6. Make up a problem about when you started to work and when you finished work, and how much you earned in all. (Make the numbers easy so you can work the problem!)

7. Make up a problem about how many pieces of candy you can buy for 5 cents and how many pieces of this candy you could get for 10 cents.

8. Suppose next summer's vacation has already started. Make up a two-step problem about how many weeks long your vacation is and how many days there are still left in your vacation.

Three-Figure Quotients



$$\begin{array}{r} 145 \\ 32\overline{)4640} \\ 32 \\ \hline 144 \\ 128 \\ \hline 160 \\ 160 \end{array}$$

1. Ellen's uncle owns a small airplane that he uses for business trips. He says that last month he flew a total of 4640 miles. He was in the air 32 hours. How many miles an hour did he average?

To find out, you divide 4640 by 32. The division is shown at the left. It is done just like other division you have had except that you bring down figures from the dividend *twice* instead of once.

Copy, divide, and check.

	a	*b*	*c*	*d*
2.	$12\overline{)1488}$	$43\overline{)5676}$	$34\overline{)7956}$	$23\overline{)7866}$
3.	$54\overline{)8208}$	$73\overline{)54166}$	$64\overline{)52800}$	$32\overline{)26912}$
4.	$87\overline{)79518}$	$75\overline{)46125}$	$94\overline{)59690}$	$55\overline{)17270}$
5.	$85\overline{)61880}$	$93\overline{)39525}$	$97\overline{)80122}$	$84\overline{)53340}$

Page 284 provides enrichment material which can be used after this page.

Zeros in the Quotient

1. Last month, Bill's father drove his car 2289 miles. His car goes about 21 miles on a gallon of gasoline. Bill's father wanted to find out how many gallons of gasoline he had used, so he divided 2289 by 21.

```
  109
21)2289
   21
   189
   189
```

The division is shown at the right. When you bring down 8, you find that 21 will not go into 18. So you write 0 in the quotient above the 8 and bring down the next figure, 9. Now divide 189 by 21 and write the quotient figure, 9, in the ones place above the 9. How many gallons had Bill's father used?

```
  230
12)2760
  24
  36
  36
   0
```

2. Nora reads different kinds of books at different rates. She reads some faster than others. She wanted to find how many words a minute she was reading in a book she had borrowed from the library. She timed herself and found she had read 2760 words in 12 minutes.

Do you see how 2760 is divided by 12? How many words a minute had Nora read?

Copy, divide, and check.

	a	*b*	*c*	*d*
3.	$23\overline{)6992}$	$36\overline{)7344}$	$25\overline{)7550}$	$41\overline{)8528}$
4.	$74\overline{)15392}$	$50\overline{)15400}$	$84\overline{)42588}$	$60\overline{)54240}$
5.	$53\overline{)22260}$	$13\overline{)3900}$	$87\overline{)18096}$	$93\overline{)59520}$
6.	$22\overline{)8960}$	$43\overline{)1731}$	$74\overline{)2250}$	$42\overline{)6312}$
7.	$56\overline{)6048}$	$25\overline{)5006}$	$45\overline{)9027}$	$94\overline{)19500}$
8.	$63\overline{)6700}$	$42\overline{)3810}$	$70\overline{)7375}$	$86\overline{)5160}$

Bob's Records

Bob keeps a careful record of the number of eggs laid by some of the hens in his flock. He has "trap nests" so that he can tell which hens are laying the largest number of eggs. Here is Bob's record of the eggs laid by four of his hens in six months.

Month	Hen 1	Hen 2	Hen 3	Hen 4
January	13	17	15	21
February	9	13	10	16
March	20	20	18	22
April	25	28	26	29
May	17	23	20	26
June	15	19	17	23

1. Find how many eggs were laid by each of the four hens in six months.

2. Find how many eggs were laid each month by all four hens.

3. Find the total number of eggs laid by all four hens in six months by adding your answers to Problem 1. Then add the Problem 2 answers. Are the two sums the same?

Dividing Dollars and Cents

Bob also keeps a record of the number of eggs he sells and the money he receives for the eggs. Here is Bob's record for the month of February.

Week Ending	Eggs Sold	Money Received
Feb. 7	7 doz.	$ 5.25
Feb. 14	9 doz.	7.20
Feb. 21	10 doz.	7.28
Feb. 28	15 doz.	10.20

1. How many dozen eggs did Bob sell in February?
2. How much money did he get for them?
3. In March, Bob sold 53 dozen eggs for $32.86. He divided $32.86 by 53 to find the average price per dozen eggs.

$$\begin{array}{r} \$\ .62 \\ 53\overline{)\$32.86} \\ 318 \\ \hline 106 \\ 106 \\ \hline \end{array}$$

Money numbers are divided like other numbers, but the dollar sign and the point are put in the quotient exactly above the dollar sign and point in the dividend.

How much a dozen did Bob get for his eggs in March?

4. Find Bob's average price per dozen eggs in February.

Copy, divide, and check.

	a	*b*	*c*	*d*
5.	$42\overline{)\$9.66}$	$21\overline{)\$17.43}$	$64\overline{)\$53.12}$	$73\overline{)\$45.99}$
6.	$32\overline{)\$2.56}$	$76\overline{)\$3.80}$	$53\overline{)\$42.40}$	$97\overline{)\$38.80}$
7.	$43\overline{)\$74.82}$	$56\overline{)\$181.44}$	$24\overline{)\$48.96}$	$75\overline{)\$603.00}$
8.	$60\overline{)\$44.40}$	$80\overline{)\$40.00}$	$30\overline{)\$192.00}$	$90\overline{)\$50.40}$

How Well Can You Divide?

Copy each of the examples below, divide, and check.

Can you divide with one-figure divisors?

	a	*b*	*c*	*d*
1.	$2\overline{)150}$	$5\overline{)190}$	$8\overline{)392}$	$7\overline{)658}$
2.	$6\overline{)1608}$	$3\overline{)1788}$	$9\overline{)1575}$	$8\overline{)4920}$

Can you find one-figure quotients?

3.	$23\overline{)138}$	$55\overline{)440}$	$32\overline{)256}$	$76\overline{)380}$
4.	$97\overline{)388}$	$89\overline{)267}$	$75\overline{)525}$	$56\overline{)280}$

Can you find two-figure quotients?

5.	$32\overline{)992}$	$42\overline{)966}$	$21\overline{)882}$	$64\overline{)832}$
6.	$43\overline{)2322}$	$71\overline{)5893}$	$54\overline{)3294}$	$82\overline{)6396}$

Can you find three-figure quotients?

7.	$43\overline{)26617}$	$62\overline{)58590}$	$21\overline{)17199}$	$52\overline{)21996}$
8.	$94\overline{)87608}$	$86\overline{)79722}$	$41\overline{)19475}$	$74\overline{)13690}$

Can you divide with zeros in the quotient?

9.	$63\overline{)4410}$	$40\overline{)3200}$	$97\overline{)5820}$	$70\overline{)6300}$
10.	$94\overline{)57152}$	$53\overline{)48071}$	$80\overline{)64400}$	$32\overline{)13088}$

Can you divide with final remainders?

11.	$33\overline{)2331}$	$72\overline{)1880}$	$63\overline{)5080}$	$54\overline{)3999}$
12.	$42\overline{)3500}$	$94\overline{)8768}$	$37\overline{)760}$	$80\overline{)4830}$

Can you divide dollars and cents?

13.	$6\overline{)\$5.82}$	$9\overline{)\$5.22}$	$21\overline{)\$6.30}$	$43\overline{)\$2.58}$
14.	$52\overline{)\$49.92}$	$34\overline{)\$206.72}$	$73\overline{)\$540.20}$	$95\overline{)\$139.65}$

Numbers With Zeros

Do you remember how to read and write numbers with zeros in them? This page gives practice with zeros.

1. Tom read in the paper that 17,906 people had attended a baseball game. How do you read this number? How would you read it if the zero were left out?

2. Ann saw an advertisement of a table radio priced $20.75. Read this number. How would you read it without the zero?

3. How many millions are there in the number 20000000? Where do you write commas in this number?

Read these numbers:

	a	*b*	*c*	*d*
4.	3,085	2,020	15,007	40,604
5.	$7.08	$10.02	$100.50	$30.00

6. On the blackboard, write fifty thousand four hundred in figures. How many zeros did you use?

7. Write forty million in figures on the board. How many commas did you use? How many zeros?

8. Write twenty dollars and nine cents in figures.

9. Write sixty thousand dollars in figures.

10. Write these six numbers in figures in columns, and find the sum: Two hundred seven, four thousand four, six thousand ten, ten thousand fifty, nine hundred eighty, twenty thousand forty-five.

11. Write these six money numbers in figures in columns, and add them: One dollar and fifty cents, seven dollars, two dollars and nine cents, thirty dollars and five cents, ten dollars and ninety cents, seventy cents.

Problems With Several Steps

1. Sue bought 8 jello molds for a dime apiece, and a cookie-cutting set for 69 cents. She gave the clerk two dollars. How much change did she get back?

This problem has three steps. First, you must find the total cost of the 8 jello molds. Then you must add this to 69 cents to find the total amount Sue spent. What is the last step? How much change did Sue get?

Some of the following problems have two steps. Some have more than two steps. Read each problem carefully and think what steps you must take to solve it. Then find the answer.

2. Last summer on their vacation, the Lanes visited national parks in the West. In just three weeks, they drove 2982 miles. How many miles a day did they average?

3. For 6 days, Nancy practiced her piano lesson 40 minutes a day. How many hours did she practice in that time?

4. Last year, Sam's Christmas vacation was 1 week and 5 days long. Next year it will be 2 weeks and 1 day long. How many days longer will his vacation be next year than last year?

5. One Saturday, Don's father took 6 boys and their bicycles to the lake in his truck. If the average weight of each boy and his bicycle was 120 pounds, how much less than half a ton was the total weight of the boys and their bikes?

6. Don helped his father in the orchard after school one week. He worked 2 hours a day for the 5 school days and 4 hours on Saturday. If his father paid him 40 cents an hour, how much did Don earn that week?

7. With the money he earned in Problem 6, Don bought a dozen fancy strawberry plants for 25 cents each. How much of his money did Don have left?

8. Nora wanted to find how many words a minute she was reading in a book she had borrowed from the library. She read 5 pages in 8 minutes. There were 32 lines on each page and about 10 words on each line. How many words a minute was Nora reading?

9. Bill's baseball team was playing Joe's team. At the end of the sixth inning, the scoreboard looked like this:

Bill's team	2	0	1	4	0	3
Joe's team	0	3	1	2	2	1

Which team was ahead? How many runs ahead was it?

10. For our class party, we need 4 dozen doughnuts at 30 cents a dozen and other food costing $2.50. If we have $4.00 in our party fund, how much will we have left after buying all the food?

11. It cost Bob $38.50 to buy and raise 73 chickens. He sold them for an average of 96 cents a chicken. How much money did he make?

Page 285 provides enrichment material which can be used after this page.

Tables and Graphs

	Boys	Girls	Total
Kindergarten	37	29	?
Grade 1	40	35	?
Grade 2	32	28	?
Grade 3	24	31	?
Grade 4	28	27	?
Grade 5	23	19	?
Grade 6	18	22	?
Totals	?	?	?

This table shows the number of boys and girls in each grade in Ann's school. Copy the table. Finish the table by adding the numbers *across* and by adding them *down*. In what two ways do you find the total number of children in the school? Be sure the two sums are the same.

Use your table to answer these questions.

1. How many children are there in the whole school?

2. How many more boys than girls are in Ann's school?

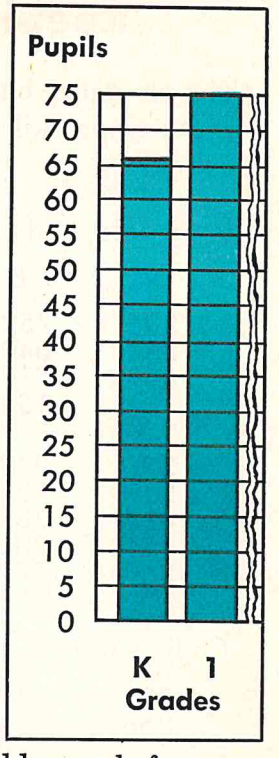
3. How many more children are there in the first grade than in the kindergarten?

4. How many fewer children are there in the second grade than in the first grade?

5. How many more children are there in the kindergarten than in the fifth grade?

6. How many more children are there in the fifth grade than in the sixth grade?

Ann decided to turn the table on page 140 into a graph. She made a graph of the *total number of pupils in each grade.* At the right is shown the way she started her graph. Up the left side, she made a number scale to show the number of pupils. Across the bottom, she made a place for each grade. She marked K for Kindergarten, 1 for Grade 1, and so on.



Ann drew the bar for K (Kindergarten) up as far as 66 on the number scale. The number 66 is not written on the graph, so Ann made the bar just a little higher than the line which shows 65.

The bar for Grade 1 came just to 75.

Draw the complete graph on your paper. Use the numbers in your table from page 140 in making the bars. Think carefully how high each bar should come before you draw it.

Use your graph to answer the following questions.

7. Which class has the most children in it?

8. Which class has the next most children in it?

9. Which class has the smallest number of children in it?

10. How many more children does the largest class have than the smallest class?

11. Which two classes are exactly the same size?

12. Which class is almost twice as large as Grade 6?

13. Which class is almost the same size as Grade 6?

Page 286 provides enrichment material which can be used after this page.

Keeping Up Your Skills

The examples on this page will help you keep up and improve your skills in addition, subtraction, and multiplication.

Copy, add, and check.

	a	b	c	d	e
1.	306 887 649 175	7527 6408 7790 1546	468 2233 7708 93	$6.39 6.50 2.75 5.13	$ 73.48 124.04 49.89 96.67
2.	357 359 485 151 868	2494 1284 3820 8069 5790	67 9514 886 7213 4690	$7.45 5.75 2.53 8.76 6.19	$695.80 83.45 212.89 910.09 38.97

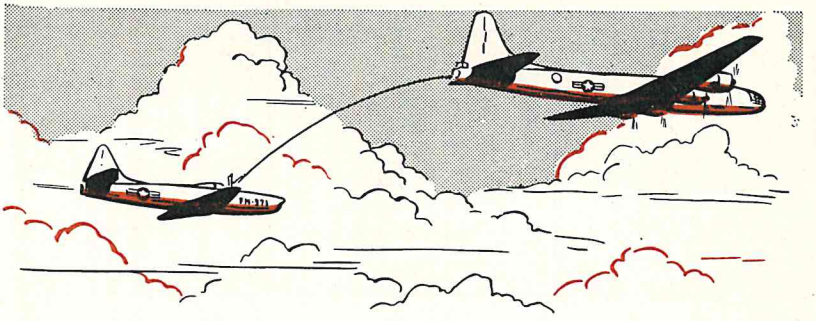
Copy, subtract, and check.

3.	790 366	102 45	639 372	1207 408	1265 859
4.	7814 7188	7249 4267	9130 2791	15501 7283	84653 54946
5.	$1.50 .95	$7.02 6.97	$72.07 24.04	$181.66 96.08	$910.00 526.54

Copy, multiply, and check.

6.	56 37	78 29	49 60	90 70	$ .93 64
7.	294 28	490 93	607 45	$1.48 58	$8.50 60
8.	428 174	706 608	356 259	783 307	$5.29 150

Finding the Right Quotient



1. In an endurance test, an airplane stayed in the air 1008 hours before it landed. To find how many days the plane stayed up, divide 1008 by 24. Why do you divide by 24?

Since $10 \div 2 = 5$, try 5 for the first trial quotient. But $5 \times 24 = 120$, and 120 is larger than 100, the number you subtract from. So 5 must be too large.

Instead of 5, try the next smaller number, 4.

Finish the division. How many days did the airplane stay up? How many weeks did it stay up?

Quotient too Large

$$\begin{array}{r} 5 \\ 24\overline{)1008} \\ 120 \end{array}$$

Product too Large

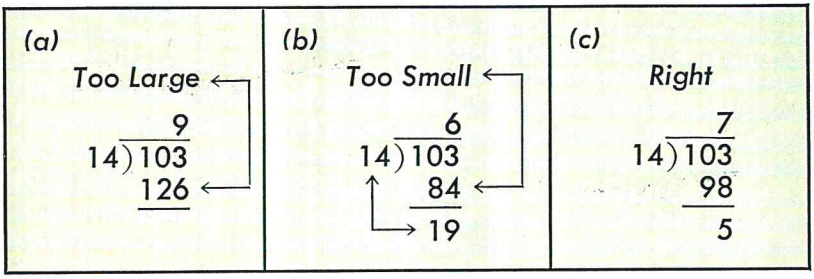
Right

$$\begin{array}{r} 4 \\ 24\overline{)1008} \\ 96 \end{array}$$

Copy, divide, and check.

	a	*b*	*c*	*d*
2.	$35\overline{)240}$	$23\overline{)172}$	$45\overline{)380}$	$84\overline{)695}$
3.	$56\overline{)376}$	$93\overline{)495}$	$64\overline{)297}$	$76\overline{)3000}$
4.	$34\overline{)952}$	$46\overline{)1150}$	$92\overline{)4508}$	$25\overline{)950}$
5.	$83\overline{)2241}$	$76\overline{)1432}$	$36\overline{)1404}$	$64\overline{)1848}$

Trying Several Quotient Figures

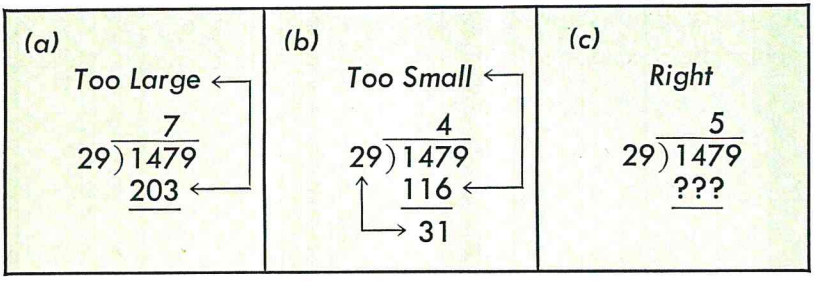


1. Sometimes you have to try several quotient figures before you get the right one.

Divide 103 by 14. You may think, $10 \div 1 = 10$. But, since a single quotient figure can never be more than 9, you try 9. When you multiply, you find that the product is too large (See Box *a* above).

Next, you try a smaller figure—perhaps 6. But when you multiply 14 by 6 (Box *b*) you see that 6 is too small because when you subtract 84 from 103, the remainder, 19, is larger than 14, the number you are dividing by.

Now try 7 (Box c). Multiply 14 by 7 and subtract. Since the remainder, 5, is smaller than the divisor, 7 must be right. Check your answer by multiplying.



2. Divide 1479 by 29. *(a)* You may think: $14 \div 2 = 7$. But when you multiply, you find the product is much too large.

(b) Here, you will save yourself time if you think: 29 is almost 30. $14 \div 3 = 4$. Multiply 29 by 4 and subtract. But 4 is just a little too small. How do you know?

(c) Then 5 is probably the correct quotient. Divide 1479 by 29 on your paper. What is the quotient? Check your answer by multiplying.

3. On your paper, divide 100 by 16. Try a quotient figure that seems right. If it is too large, try a smaller figure. If this figure is too small, try a larger figure. What is your answer? Check it.

4. Divide 3597 by 49. Since 49 is almost 50, you might try dividing 35 by 5 to get your first quotient figure. What is your quotient? Check it.

Copy, divide, and check.

	a	*b*	*c*	*d*
5.	$14\overline{)60}$	$16\overline{)93}$	$13\overline{)100}$	$12\overline{)102}$
6.	$15\overline{)125}$	$18\overline{)154}$	$39\overline{)169}$	$69\overline{)3381}$
7.	$27\overline{)1971}$	$16\overline{)1040}$	$58\overline{)1682}$	$47\overline{)3854}$

Practice With Two-Figure Divisors

How well can you now divide by two-figure numbers? Copy, divide, and check.

	a	*b*	*c*	*d*
1.	$32\overline{)224}$	$43\overline{)258}$	$61\overline{)500}$	$72\overline{)381}$
2.	$53\overline{)2226}$	$21\overline{)1533}$	$85\overline{)4505}$	$33\overline{)2046}$
3.	$63\overline{)4560}$	$92\overline{)8000}$	$76\overline{)6093}$	$45\overline{)3621}$
4.	$53\overline{)6801}$	$22\overline{)17732}$	$94\overline{)32900}$	$83\overline{)76692}$
5.	$62\overline{)\$5.58}$	$54\overline{)\$45.90}$	$93\overline{)\$381.30}$	$75\overline{)\$69.00}$
6.	$15\overline{)570}$	$34\overline{)3194}$	$18\overline{)882}$	$49\overline{)1911}$

Page 287 provides enrichment material which can be used after this page.

Can You Tell Which Is Larger?

These examples will show you how well you understand various kinds of numbers. There are 20 pairs of numbers. Tell or write the larger number in each pair.

1. 97 or 101
2. 618 or 816
3. 1204 or 799
4. 27,249 or 27,429
5. 1,000,000 or 989,756
6. \$4.49 or \$5
7. \$10 or \$9.85
8. \$19.50 or \$25
9. \$125 or \$97.50
10. XXIX or XXIV
11. XXXVII or XXX
12. 3 ft. or 30 in.
13. 3 qt. or 1 gal.
14. 1 hr. or 75 min.
15. 2 weeks or 12 days
16. 1 lb. or 20 oz.
17. $\frac{1}{2}$ or $\frac{1}{4}$
18. $\frac{5}{8}$ or $\frac{7}{8}$
19. $\frac{1}{8}$ or $\frac{1}{4}$
20. $\frac{7}{8}$ or $\frac{1}{2}$

Can You Arrange Numbers in Order?

1. Write 28°, 7°, 33°, −4° (4° below zero) in order, from the warmest to the coldest.

2. Write \$7.98, \$5, \$3.50, \$10.06, and 75¢ in the order of their value, the largest first.

3. Write the heights 4 ft. 10 in., 5 ft. 4 in., 5 ft., 4 ft. 9 in., and 6 ft. in order, from the tallest to the shortest.

4. Arrange $\frac{1}{6}$, $\frac{1}{2}$, $\frac{1}{8}$, $\frac{1}{4}$, and $\frac{1}{3}$ in the order of their value, starting with the largest.

5. Write these numbers in figures in the order of their value, the smallest first: one thousand ten, one hundred one, eleven, one thousand one hundred, one hundred ten.

Comparing Numbers

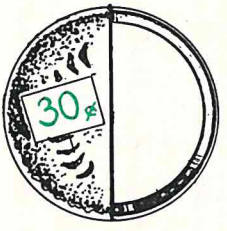
These are quickies. Just tell or write the answers.

1. Jill sold three roses for 25 cents and some violets for 15 cents. How much *more* did she get for the roses than the violets?

2. Don picked 16 tomatoes and 8 ears of corn. How many *times* as many tomatoes as ears of corn did he pick?

3. Sue used 3 eggs in making a cake. What *part* of a dozen eggs is 3 eggs?

4. It took Sue 36 minutes to make a cake and 12 minutes to bake some biscuits. How many times as long did the cake take as the biscuits?



5. Sally bought half a pie for 30 cents. At this rate, how much would a whole pie have cost?

6. Bill has ridden his bicycle 8 miles. This is just halfway to where he wants to go. How many miles will Bill ride in all?

7. Jean saved 40 cents this week. Her father promised to give her twice as much as she saved. How much will he give her?

8. Bill has 3 blue marbles and 6 red marbles. He has how many times as many red marbles as blue ones?

9. Judy is 6 years old. Her cousin Jennie is 18 years old. Jennie is how many times as old as Judy?

10. Lemons are 3 for 10 cents. How many times as much must Sally pay for 12 lemons as for 3 lemons? How much must she pay for 12 lemons?

11. If plums are 3 for 5 cents, how many plums can I buy for 15¢?

Finding Parts of Numbers

Copy these examples and fill in the missing numbers.

	a	*b*
1.	$\frac{1}{2}$ gal. = ? qt.	$\frac{1}{2}$ min. = ? sec.
2.	$\frac{1}{3}$ min. = ? sec.	$\frac{1}{3}$ doz. eggs = ? eggs
3.	$\frac{1}{4}$ doz. eggs = ? eggs	$\frac{3}{4}$ doz. eggs = ? eggs
4.	$\frac{1}{4}$ lb. = ? oz.	$\frac{3}{4}$ lb. = ? oz.
5.	$\frac{1}{4}$ yd. = ? in.	$\frac{3}{4}$ yd. = ? in.
6.	$\frac{1}{3}$ ft. = ? in.	$\frac{2}{3}$ ft. = ? in.
7.	$\frac{1}{4}$ of 240 = ?	$\frac{1}{5}$ of 45 = ?
8.	$\frac{1}{3}$ of 126 = ?	$\frac{1}{9}$ of 360 = ?
9.	$\frac{1}{8}$ of 248 = ?	$\frac{1}{2}$ of 164 = ?
10.	$\frac{1}{7}$ of 490 = ?	$\frac{1}{6}$ of 540 = ?

See if you can work all these problems as quickies.

11. Bill ran a race in 30 seconds. What part of a minute is this?

12. Bob sold 4 ears of corn. What part of a dozen is this? If Bob was getting 60 cents a dozen ears for his corn, how much should he charge for 4 ears?

13. Sally was paid 30 cents an hour for staying with Mrs. Bell's baby. One afternoon she stayed with the baby for 30 minutes. How much did she earn?

14. Sally wants to measure $\frac{3}{4}$ yard of ribbon. How many inches must she measure?

15. Jean paid 20 cents for a candy bar that weighed 4 ounces. What part of a pound did she buy? How much would a pound of the candy cost at this rate?

Bob's Cash Account

Bob keeps a record of the money he takes in from his chickens and the money he spends on them.

1. At the beginning of one week, on April 12, Bob had \$8.25. On three days during the week, he sold eggs for \$1.50, 78¢, and \$2.52. He also sold some chickens that week for \$4.44. How much money would Bob have had at the end of the week if he hadn't spent any?

2. That week, Bob spent \$4 for some baby chicks, \$3.39 for feed, and 96¢ for grit for his chickens. How much did he spend?

3. How much money should Bob have left at the end of the week? (Subtract your answer to Problem 2 from your answer to Problem 1.)

Bob kept his record in the form of a **cash account**. Here is the way his cash account for the week looked.

Date	Money Received		Date	Money Spent	
Apr. 12	Cash on hand	\$8.25	Apr. 15	Chicks	\$4.00
14	Eggs	1.50	16	Feed	3.39
16	Eggs	.78		Grit	.96
	Chickens	4.44			
18	Eggs	2.52	18	Balance	9.14
		\$17.49			\$17.49

4. How did Bob find his balance of \$9.14, the money he had left at the end of the week? This is the "cash on hand" he would have at the beginning of the next week.

Pages 288 and 289 provide enrichment material which can be used after this page.

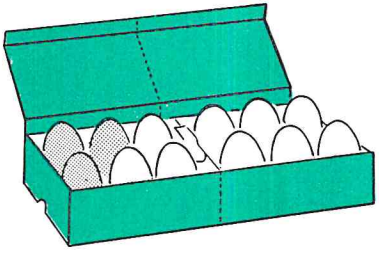
Adding and Subtracting Fractions

1. Sue brought a big apple to school. Before school started, she cut the apple into halves and gave $\frac{1}{2}$ of the apple to Jill. What fraction of her apple did Sue have left?

$1 - \frac{1}{2} = ?$

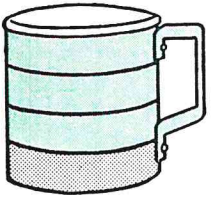
Here you *subtracted* $\frac{1}{2}$ from 1.

How many apples are $\frac{1}{2}$ of an apple and $\frac{1}{2}$ of an apple? $\frac{1}{2} + \frac{1}{2} = ?$ Here you *added* $\frac{1}{2}$ and $\frac{1}{2}$, making $\frac{2}{2}$, or 1.



2. Bob sold $\frac{1}{4}$ dozen eggs to Mrs. Carter. Mrs. Carter's eggs are shaded. Bob sold $\frac{3}{4}$ dozen eggs to Mrs. Denton. How many dozen eggs did Bob sell in all?

$\frac{1}{4} + \frac{3}{4} = ?$

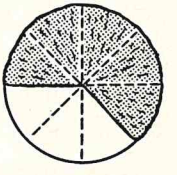


3. The measuring cup at the left is divided into fourths. It is shaded to show that it is $\frac{1}{4}$ full of milk. Sue has used the rest of the cup of milk. What fraction of the cup has Sue used?

$1 - \frac{1}{4} = ?$

4. Mrs. Lane cut a chocolate layer cake to eat for lunch. She, Jean, and Tony each had $\frac{1}{8}$ of the cake. They ate $\frac{3}{8}$ of the cake. What fraction of the cake was left?

$$1 - \frac{3}{8} = ?$$

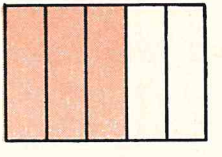


5. Sue made an apple pie one Saturday afternoon. The family ate $\frac{5}{6}$ of the pie for dinner. What fraction of the pie was left?

$$1 - \frac{5}{6} = ?$$

6. Three fifths of the rectangle at the right is shaded. What fraction of the rectangle is not shaded?

$$1 - \frac{3}{5} = ?$$

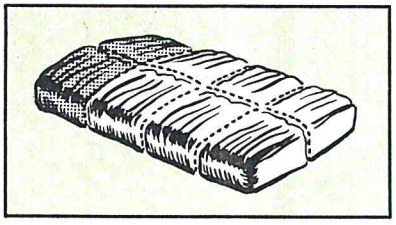


See if you can add and subtract the fractions below.

	a	*b*	*c*	*d*
7.	$1 - \frac{1}{2} = ?$	$1 - \frac{3}{4} = ?$	$\frac{1}{4} + \frac{3}{4} = ?$	$\frac{1}{2} + \frac{1}{2} = ?$
8.	$1 - \frac{5}{8} = ?$	$\frac{5}{8} + \frac{3}{8} = ?$	$1 - \frac{5}{6} = ?$	$\frac{1}{6} + \frac{5}{6} = ?$
9.	$1 - \frac{1}{4} = ?$	$1 - \frac{3}{8} = ?$	$1 - \frac{1}{8} = ?$	$1 - \frac{7}{8} = ?$
10.	$1 - \frac{3}{5} = ?$	$\frac{2}{5} + \frac{3}{5} = ?$	$1 - \frac{1}{5} = ?$	$\frac{1}{5} + \frac{4}{5} = ?$

Changing Fractions to Lower Terms

You have already changed some fractions to lower terms when you changed them to simpler forms. These two pages will show you more about changing fractions.



1. Peggy has a chocolate bar divided into eighths. Part of the bar at the left is shaded to show that Peggy ate $\frac{2}{8}$.

In the fraction $\frac{2}{8}$, the number below the line (8) is called the **denominator**. It tells the number of equal parts into which the bar is divided. The number above the line (2) is the **numerator**. It tells how many of those parts Peggy ate.

The **numerator** and **denominator** are called the **terms** of a fraction.

When Peggy eats $\frac{2}{8}$ of the bar, she eats $\frac{1}{4}$ of it. $\frac{2}{8} = \frac{1}{4}$. Changing $\frac{2}{8}$ to $\frac{1}{4}$ is called changing the fraction to lower terms. Both terms of the fraction $\frac{2}{8}$ were divided by the same number, 2.

2. When Peggy has eaten $\frac{4}{8}$ of the bar, she has eaten $\frac{1}{2}$ of the bar. $\frac{4}{8} = \frac{1}{2}$. By what number were both terms of $\frac{4}{8}$ divided?

$$\frac{9 \div 3}{12 \div 3} = \frac{3}{4}$$

3. Bob sold 9 eggs. Nine eggs are $\frac{9}{12}$ of a dozen eggs. The fraction $\frac{9}{12}$ can be changed to lower terms. Both terms can be divided exactly by 3. $\frac{9}{12}$ doz. = ? doz.

4. Jean has 10 cents. She wants to spend 5 cents for a pencil. What part of her money will she spend?

She will spend $\frac{5}{10}$ of her money. Change $\frac{5}{10}$ to lower terms by dividing both terms by 5. $\frac{5}{10} = ?$

5. Joe practiced for 20 minutes on his trumpet. To find what part of an hour he practiced, change $\frac{20}{60}$ to lower terms. You can divide both 20 and 60 by 10, so $\frac{20}{60} = \frac{2}{6}$. You can change $\frac{2}{6}$ to still lower terms. $\frac{2}{6} = ?$

When both terms of a fraction cannot be divided by the same number, the fraction is in its ***lowest terms.***

6. Six of the following numbers can be divided exactly by 2. Which numbers are they? What are the quotients?

13 10 18 17 22 9 14 30 26

7. Divide by 5 the numbers that can be divided exactly by 5:

24 32 15 10 12 40 35 60

8. Divide by 10 the numbers that are exactly divisible by 10:

45 20 38 120 25 16 90 24

9. Divide by 3 the numbers that are exactly divisible by 3:

12 23 15 60 20 42 54 40

10. What 2 numbers will 6 divide exactly? 12? 33? 24?

11. What number will divide both 10 and 12 exactly? Both 6 and 15? Both 10 and 25? Both 14 and 21?

Copy these fractions and change them to lowest terms.

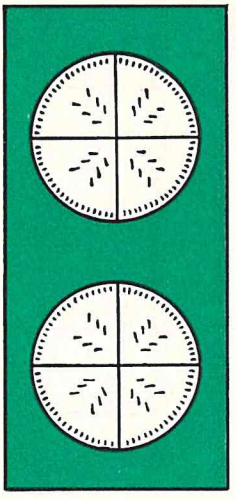
	a	*b*	*c*	*d*
12.	$\frac{6}{10} = ?$	$\frac{8}{12} = ?$	$\frac{4}{12} = ?$	$\frac{6}{12} = ?$
13.	$\frac{10}{12} = ?$	$\frac{4}{16} = ?$	$\frac{8}{16} = ?$	$\frac{10}{16} = ?$
14.	$\frac{12}{16} = ?$	$\frac{8}{24} = ?$	$\frac{12}{36} = ?$	$\frac{18}{36} = ?$
15.	$\frac{10}{60} = ?$	$\frac{30}{60} = ?$	$\frac{20}{60} = ?$	$\frac{45}{60} = ?$
16.	$\frac{7}{49} = ?$	$\frac{6}{42} = ?$	$\frac{20}{36} = ?$	$\frac{25}{45} = ?$
17.	$\frac{18}{27} = ?$	$\frac{24}{32} = ?$	$\frac{15}{20} = ?$	$\frac{14}{35} = ?$
18.	$\frac{15}{45} = ?$	$\frac{2}{16} = ?$	$\frac{54}{63} = ?$	$\frac{22}{44} = ?$
19.	$\frac{12}{15} = ?$	$\frac{8}{24} = ?$	$\frac{16}{40} = ?$	$\frac{80}{100} = ?$

Measure-Fractions in Lowest Terms

See if you can find fractions of measures in lowest terms. Write each of your answers in lowest terms.

1. What part of a foot is 9 inches? $\frac{9}{12} = ?$
2. Four eggs are what part of a dozen eggs?
3. Eight months are what part of a year?
4. A 6-ounce package of candy is what part of a pound?
5. What part of a pound is 12 ounces?
6. Fifteen minutes are what part of an hour?
7. Forty seconds are what part of a minute?
8. What part of an hour is 45 minutes?
9. What part of an hour is 12 minutes? 36 minutes?
10. Nine inches are what part of a yard? $\frac{9}{36} = ?$
11. Eighteen inches are what part of a yard?
12. What part of a yard is 27 inches? 24 inches?
13. What part of a day is 10 hours? $\frac{10}{24} = ?$
14. Eight hours are what part of a day?
15. Eighteen hours are what part of a day?
16. Sixteen quarts are what part of a bushel? $\frac{16}{32} = ?$
17. What part of a bushel is 24 quarts?
18. What part of a ton is 500 pounds? $\frac{500}{2000} = ?$
19. What part of a ton is 1500 pounds?
20. What part of a mile is 220 yards? $\frac{220}{1760} = ?$
21. What part of a mile is 880 yards?
22. What part of a minute is 50 seconds?
23. What part of a yard is 20 inches?
24. What part of a day is 16 hours?
25. What part of a mile is 440 yards?

Mixed Numbers



1. The Grays are very fond of apple pie. One Saturday Mrs. Gray made 2 apple pies. Five people ate Sunday dinner. Each person was served with a fourth of a pie. How many fourths did they eat? They ate 5 fourths. $\frac{5}{4}$ is the same as one whole pie and $\frac{1}{4}$ of another. So they ate $1\frac{1}{4}$ pies. $1\frac{1}{4}$ is a mixed number.

A whole number written together with a fraction is called a mixed number.

In $1\frac{1}{4}$, what is the whole number? What is the fraction?

2. Mr. Gray ate another fourth of a pie for a second helping. Now, six fourths of the pie were eaten.

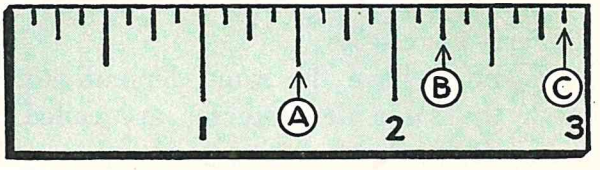
To change $\frac{6}{4}$ to a mixed number, you divide the numerator (6) by the denominator (4) and change the fraction in the mixed number to lowest terms.

How many whole pies and parts of pies are $\frac{6}{4}$ pies?

3. Make these fractions mixed numbers or whole numbers.

$\frac{7}{4} = ?$ $\frac{8}{4} = ?$ $\frac{9}{4} = ?$ $\frac{10}{4} = ?$ $\frac{11}{4} = ?$ $\frac{12}{4} = ?$

4. Arrow A shows three half inches. Change $\frac{3}{2}$ to a mixed number.



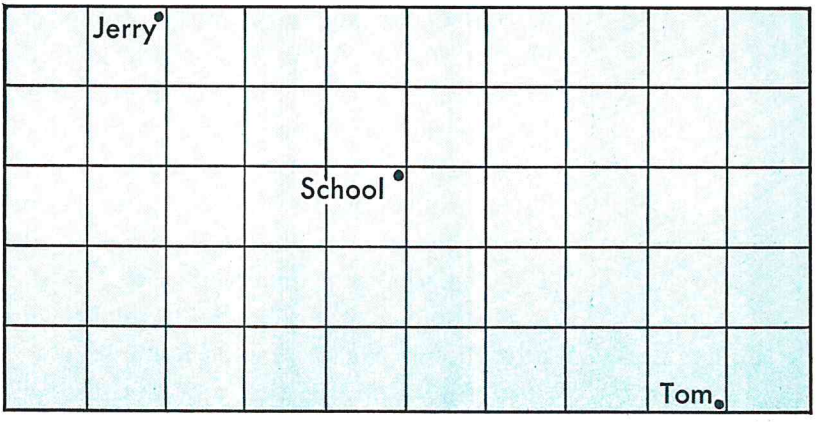
5. Arrow B shows 9 quarter inches. Change $\frac{9}{4}$ to a mixed number.

6. Arrow C shows 23 eighth inches. $\frac{23}{8} = ?$

7. $\frac{7}{2} = ?$ $\frac{10}{4} = ?$ $\frac{12}{8} = ?$ $\frac{14}{8} = ?$ $\frac{20}{8} = ?$

Pages 290 and 291 provide enrichment material which can be used after this page.

Adding Similar Fractions



1 block = $\frac{1}{8}$ mile

1. Tom drew this map to show how far he and Jerry lived from their school. The boys walk on the sidewalk to go to school. Each block is $\frac{1}{8}$ of a mile long. How many blocks does Jerry walk to go to school? What part of a mile is this? What part of a mile does Tom walk to go to school?

2. Tom wanted to find how far his house was from Jerry's house, so he added $\frac{7}{8}$ mile (the distance from his house to the school) to $\frac{5}{8}$ mile (the distance from the school to Jerry's house).

$\frac{7}{8}$ and $\frac{5}{8}$ have the same denominator (8). Fractions with the same denominator are called **similar fractions.** You add similar fractions just as you add 6 marbles and 5 marbles. 7 eighths + 5 eighths = 12 eighths. $\frac{7}{8} + \frac{5}{8} = \frac{12}{8}$ Change $\frac{12}{8}$ to a mixed number in lowest terms.

How many miles is it from Tom's house to Jerry's house?

You can check this distance on the map by counting the number of blocks Tom would walk from his house to Jerry's house.

3. Don worked $1\frac{3}{4}$ hours on Friday and $2\frac{3}{4}$ hours on Saturday. To find how many hours he worked in all, add $1\frac{3}{4}$ and $2\frac{3}{4}$.

$$\begin{array}{r} 1\frac{3}{4} \\ 2\frac{3}{4} \\ \hline 4\frac{1}{2} \end{array}$$

Add the fractions first. $\frac{3}{4} + \frac{3}{4} = \frac{6}{4}$. Change $\frac{6}{4}$ to $1\frac{1}{2}$. Write $\frac{1}{2}$ under the fractions. Carry 1 to the whole numbers. Add the whole numbers, starting with the 1 you carried. How long did Don work in all?

4. In four days, Don sold the following numbers of ears of corn: $1\frac{1}{2}$ dozen, 2 dozen, $2\frac{1}{2}$ dozen, $1\frac{1}{2}$ dozen. To find how many dozen ears he sold, add the fractions first.

$$\begin{array}{r} 1\frac{1}{2} \\ 2 \\ 2\frac{1}{2} \\ 1\frac{1}{2} \\ \hline 7\frac{1}{2} \end{array}$$

$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \frac{3}{2}$. *Think:* $\frac{3}{2} = 1\frac{1}{2}$. Write the $\frac{1}{2}$; carry the 1 to the whole numbers. Add the whole numbers.

How many dozen ears of corn did Don sell?

Copy and add. Be sure the fractions in the sums are in lowest terms.

5. *a* $\frac{2}{5} + \frac{2}{5} = ?$ *b* $\frac{1}{8} + \frac{5}{8} = ?$ *c* $\frac{3}{4} + \frac{1}{4} = ?$ *d* $\frac{3}{10} + \frac{9}{10} = ?$

6.

a	*b*	*c*	*d*	*e*	*f*
$\frac{3}{5}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{2}{3}$	$\frac{3}{4}$	$\frac{7}{10}$
$\frac{1}{5}$	$\frac{3}{8}$	$\frac{7}{8}$	$\frac{2}{3}$	$\frac{3}{4}$	$\frac{7}{10}$

7.

$1\frac{5}{8}$	$2\frac{1}{2}$	$5\frac{3}{4}$	$2\frac{2}{3}$	$4\frac{1}{6}$	$2\frac{3}{10}$
$1\frac{1}{8}$	$1\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{2}{3}$	$1\frac{5}{6}$	$\frac{9}{10}$

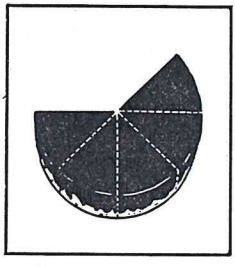
8.

$4\frac{1}{8}$	$9\frac{4}{5}$	$1\frac{2}{9}$	$\frac{5}{12}$	$7\frac{3}{8}$	$3\frac{2}{5}$
$2\frac{3}{8}$	$10\frac{3}{5}$	$5\frac{7}{9}$	$6\frac{7}{12}$	$\frac{7}{8}$	$6\frac{4}{5}$

9.

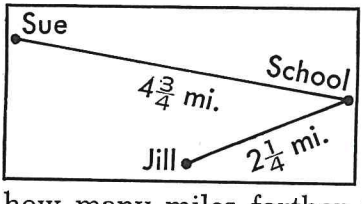
$\frac{1}{8}$	$\frac{3}{4}$	3	$1\frac{1}{8}$	$4\frac{1}{6}$	$10\frac{2}{5}$
$\frac{3}{8}$	$\frac{3}{4}$	$\frac{2}{3}$	$6\frac{3}{8}$	$\frac{5}{6}$	$1\frac{4}{5}$
$\frac{5}{8}$	$\frac{1}{4}$	$1\frac{2}{3}$	$2\frac{7}{8}$	8	$13\frac{3}{5}$

Subtracting Similar Fractions



1. The sketch at the left shows $\frac{5}{8}$ of a chocolate layer cake Ellen's family had left from lunch. That afternoon, Ellen came home from school with two friends. Ellen's mother told the three girls they could have 3 slices, or $\frac{3}{8}$ of the cake. Then what fraction of the cake was left?

To find the answer, subtract $\frac{3}{8}$ from $\frac{5}{8}$. $\frac{3}{8}$ and $\frac{5}{8}$ are similar fractions. Subtract the numerator 3 from the numerator 5 and change the answer to lowest terms. $\frac{5}{8} - \frac{3}{8} = \frac{?}{8} = ?$ What fraction of the cake was left?



2. Sue lives $4\frac{3}{4}$ miles from school. Jill lives $2\frac{1}{4}$ miles from school. To find how many miles farther from school Sue lives than Jill does, subtract $2\frac{1}{4}$ from $4\frac{3}{4}$.

$$4\tfrac{3}{4}$$
$$2\tfrac{1}{4}$$
$$2\tfrac{1}{2}$$

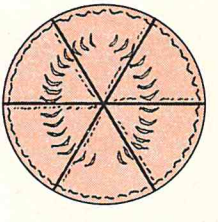
Subtract the fractions first. $\frac{3}{4} - \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$. Then subtract the whole numbers. How much farther from school does Sue live?

Copy and subtract. The fractions in your answers should be in lowest terms.

	a	b	c	d	e
3.	$\frac{4}{5} - \frac{1}{5}$	$\frac{7}{8} - \frac{1}{8}$	$\frac{3}{4} - \frac{1}{4}$	$\frac{5}{6} - \frac{1}{6}$	$\frac{7}{12} - \frac{1}{12}$
4.	$\frac{5}{8} - \frac{3}{8}$	$\frac{9}{10} - \frac{3}{10}$	$\frac{7}{9} - \frac{4}{9}$	$\frac{11}{12} - \frac{7}{12}$	$\frac{9}{16} - \frac{3}{16}$
5.	$3\frac{4}{5}$ $1\frac{2}{5}$	$5\frac{2}{3}$ $2\frac{1}{3}$	$12\frac{7}{8}$ $4\frac{3}{8}$	$2\frac{7}{10}$ $2\frac{3}{10}$	$7\frac{5}{12}$ $3\frac{1}{12}$
6.	$11\frac{1}{2}$ $7\frac{1}{2}$	$10\frac{3}{4}$ $6\frac{3}{4}$	$20\frac{3}{8}$ $9\frac{3}{8}$	$9\frac{3}{4}$ 6	$9\frac{11}{12}$ $5\frac{5}{12}$
7.	$14\frac{5}{8}$ $5\frac{1}{8}$	$8\frac{9}{10}$ $8\frac{1}{10}$	$27\frac{3}{5}$ $18\frac{3}{5}$	$10\frac{13}{16}$ $5\frac{7}{16}$	$41\frac{7}{12}$ $26\frac{5}{12}$
8.	$82\frac{5}{9}$ $79\frac{2}{9}$	$35\frac{13}{20}$ $7\frac{3}{20}$	$31\frac{5}{7}$ $29\frac{1}{7}$	$45\frac{1}{4}$ $19\frac{1}{4}$	$20\frac{11}{12}$ $1\frac{7}{12}$
9.	$65\frac{3}{4}$ $58\frac{1}{4}$	$27\frac{7}{16}$ 18	$51\frac{5}{9}$ $27\frac{5}{9}$	$10\frac{4}{5}$ $10\frac{3}{5}$	$77\frac{17}{25}$ $67\frac{7}{25}$

Counting Back With Fractions

1. A pie was on the lunch counter. It was divided in sixths. After Sam bought 1 piece, what fraction of the pie was left? When the next piece was taken, $\frac{4}{6}$ or ? of the pie was left. When the third piece was taken, $\frac{3}{6}$ or ? of the pie was left.



Tell what part was left after each of the other pieces was taken. You have counted backward by sixths.

2. Look at a ruler. Count backward by fourths from 3 inches. Start: 3, $2\frac{3}{4}$, $2\frac{1}{2}$.

3. Count backward by 8ths from 2. Start: 2, $1\frac{7}{8}$, $1\frac{3}{4}$.

Keeping in Practice

This page will help you keep up and improve your skills in addition, subtraction, multiplication, and division.

Copy, add, and check.

	a	b	c	d	e
1.	37 46 79 45	268 985 407 797	8799 4684 5305 1934	657 1581 436 8503	\$23.08 7.73 .99 24.00
2.	866 573 688 704 260	4155 429 950 86 7398	877 69 5926 8413 5427	\$7.65 9.72 6.18 2.75 1.05	\$125.40 18.93 94.88 62.61 313.79

Copy, subtract, and check.

3.	690 457	1129 392	2324 846	8305 2568	8703 3607
4.	\$1.20 .65	\$16.56 7.49	\$66.00 57.78	\$155.17 79.25	\$740.00 664.89

Copy, multiply, and check.

5.	75 64	68 39	180 75	496 28	409 96
6.	247 157	507 308	698 470	\$3.75 29	\$6.39 65

Copy, divide, and check.

7. $32\overline{)1568}$ $56\overline{)1512}$ $77\overline{)14399}$ $93\overline{)47244}$ $25\overline{)9020}$

8. $80\overline{)3920}$ $64\overline{)23600}$ $45\overline{)\$43.20}$ $12\overline{)\$90.00}$ $39\overline{)\$79.95}$

Using a Calendar

MAY

SUN	MON	TUE	WED	THU	FRI	SAT
.	.	.	.	.	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24 31	25	26	27	28	29	30

JUNE

SUN	MON	TUE	WED	THU	FRI	SAT
.	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	.	.	.	.

JULY

SUN	MON	TUE	WED	THU	FRI	SAT
.	.	.	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	.

Can you use this page from Jean's desk calendar?

1. On what day of the week does May start?

2. On what day of the week does July end?

3. The Fourth of July comes on what day of the week?

4. Jean's birthday is June 5. What day of the week is June 5?

5. On May 22, how many weeks is it until Jean's birthday? How many days is this?

6. Jean's school will close for the summer on the third Friday in June. What date is this?

7. Jean is planning to go on June 25 to visit her aunt for 3 weeks. On what date will her visit be over?

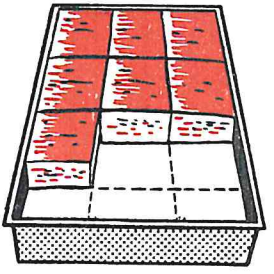
8. How many days is it from June 19 to July 4? How many weeks is this? How many days over?

9. How many days is it from May 22 to June 19? (An easy way to find this is to find the number of weeks first.)

10. How many days more than 4 weeks are there in May?

11. How many days are there altogether in May, June, and July? How many whole weeks is this? How many days over?

Borrowing With Mixed Numbers



1. Sue made some gingerbread and cut it into 12 equal pieces. The family ate 5 pieces for supper. What part of the gingerbread was left?

12 pieces − 5 pieces leaves 7 pieces. $\frac{7}{12}$ of the gingerbread was left.

The whole pan of gingerbread, you see, is $\frac{12}{12}$. What you are really doing is subtracting $\frac{5}{12}$ from $\frac{12}{12}$. $\frac{12}{12} - \frac{5}{12} = ?$

2. Sam's mother made 4 pies. She gave Sam and his friends $1\frac{1}{2}$ pies for a picnic party. Draw a picture of the 4 pies and shade $1\frac{1}{2}$ of the pies to find how many pies were left. You can see that you must divide one of the 4 pies into halves before you can subtract $1\frac{1}{2}$ pies. Four pies is the same as $3\frac{2}{2}$ pies. $4 - 1\frac{1}{2} = ?$

Copy and subtract.

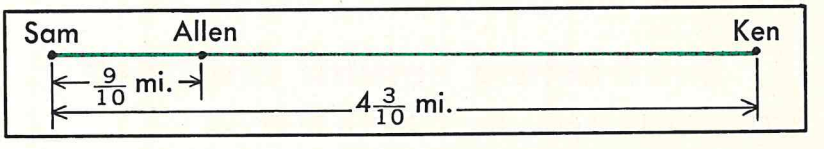
	a	b	c	d	e	f
3.	3	5	4	7	6	9
	$1\frac{1}{2}$	$2\frac{1}{4}$	$1\frac{3}{4}$	$3\frac{1}{8}$	$1\frac{5}{8}$	$6\frac{7}{10}$

4. Mrs. Lane was waiting to buy some ham at the meat counter. Another customer bought a slice of ham weighing $1\frac{3}{4}$ pounds. The clerk cut the slice from a ham weighing $7\frac{1}{4}$ pounds. Mrs. Lane said she would take the rest of the ham. To find how many pounds of ham Mrs. Lane bought, subtract $1\frac{3}{4}$ from $7\frac{1}{4}$.

$$7\tfrac{1}{4} = 6\tfrac{5}{4}$$
$$1\tfrac{3}{4} = 1\tfrac{3}{4}$$
$$5\tfrac{2}{4}$$
$$5\tfrac{2}{4} = ?$$

You cannot subtract $\frac{3}{4}$ from $\frac{1}{4}$, so borrow 1 from 7, change it to $\frac{4}{4}$, and add $\frac{4}{4}$ to $\frac{1}{4}$. $\frac{4}{4} + \frac{1}{4} = \frac{5}{4}$. $7\frac{1}{4} = 6\frac{5}{4}$. Change your answer to lowest terms.

5. One Saturday, Sam started to ride his bicycle to Ken's house which was $4\frac{3}{10}$ miles from Sam's house. When he had gone $\frac{9}{10}$ mile, he came to Allen's house. How many miles was it from Allen's house to Ken's house?



Copy these examples and write the missing numerators.

	a	b	c	d
6.	$1 = \frac{?}{3}$	$1 = \frac{?}{8}$	$2 = \frac{6}{3}$	$2 = \frac{?}{6}$
7.	$3 = \frac{?}{4}$	$1\frac{1}{4} = \frac{?}{4}$	$1\frac{1}{3} = \frac{?}{3}$	$1\frac{3}{8} = \frac{?}{8}$
8.	$3\frac{1}{4} = 2\frac{5}{4}$	$4\frac{1}{3} = 3\frac{?}{3}$	$7\frac{3}{8} = 6\frac{?}{8}$	$5\frac{3}{10} = 4\frac{?}{10}$

Copy and subtract.

	a	b	c	d	e	f
9.	$4\frac{1}{4}$ $1\frac{3}{4}$	$5\frac{1}{3}$ $2\frac{2}{3}$	$7\frac{1}{8}$ $4\frac{5}{8}$	$6\frac{2}{5}$ $3\frac{4}{5}$	$7\frac{3}{8}$ $2\frac{5}{8}$	$8\frac{1}{6}$ $4\frac{5}{6}$
10.	$6\frac{1}{5}$ $4\frac{4}{5}$	$9\frac{1}{10}$ $3\frac{3}{10}$	$4\frac{3}{8}$ $3\frac{7}{8}$	$6\frac{5}{8}$ $5\frac{7}{8}$	$8\frac{3}{10}$ $2\frac{7}{10}$	$10\frac{1}{12}$ $3\frac{5}{12}$

Practice in Adding Similar Fractions

Copy and add these similar fractions.

	a	b	c	d	e	f
1.	$\frac{3}{5}$ $\frac{1}{5}$	$\frac{1}{8}$ $\frac{5}{8}$	$\frac{2}{3}$ $\frac{2}{3}$	$\frac{3}{4}$ $\frac{3}{4}$	$\frac{5}{8}$ $\frac{7}{8}$	$\frac{7}{10}$ $\frac{9}{10}$
2.	$2\frac{1}{3}$ $3\frac{1}{3}$	$3\frac{2}{5}$ $1\frac{1}{5}$	$4\frac{1}{8}$ $2\frac{3}{8}$	$1\frac{1}{4}$ $\frac{3}{4}$	$6\frac{1}{3}$ $2\frac{2}{3}$	$4\frac{7}{8}$ $3\frac{1}{8}$
3.	$5\frac{1}{2}$ $2\frac{1}{2}$	$2\frac{3}{8}$ $6\frac{5}{8}$	$5\frac{2}{3}$ $4\frac{2}{3}$	$3\frac{7}{10}$ $5\frac{7}{10}$	$\frac{5}{8}$ $2\frac{7}{8}$	$7\frac{11}{12}$ $5\frac{5}{12}$
4.	$2\frac{1}{2}$ $3\frac{1}{2}$ $1\frac{1}{2}$	$6\frac{2}{3}$ $1\frac{1}{3}$ $4\frac{2}{3}$	$5\frac{1}{4}$ $3\frac{3}{4}$ $2\frac{3}{4}$	$3\frac{5}{8}$ 6 $2\frac{3}{8}$	$1\frac{3}{8}$ $\frac{5}{8}$ $1\frac{7}{8}$	$2\frac{3}{10}$ $5\frac{9}{10}$ $8\frac{7}{10}$

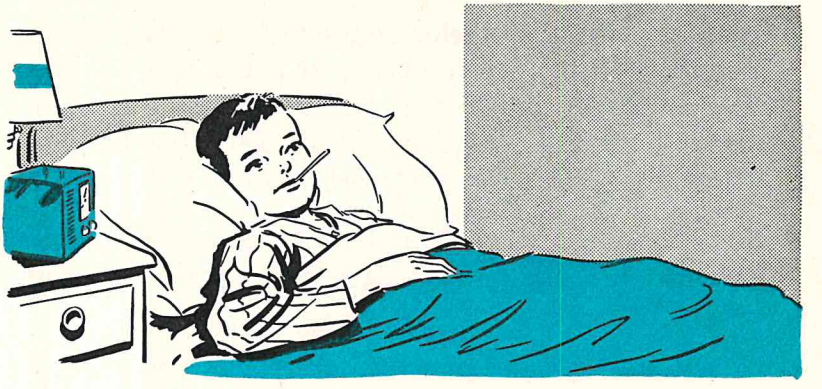
Subtracting Similar Fractions

Copy and subtract these similar fractions.

	a	b	c	d	e
1.	$\frac{3}{4}-\frac{1}{4}$	$\frac{4}{5}-\frac{3}{5}$	$\frac{7}{8}-\frac{1}{8}$	$1-\frac{1}{6}$	$2-\frac{7}{10}$

	a	b	c	d	e	f
2.	$4\frac{7}{8}$ $1\frac{1}{8}$	$9\frac{1}{2}$ $7\frac{1}{2}$	$5\frac{2}{3}$ $5\frac{1}{3}$	$10\frac{5}{8}$ $6\frac{3}{8}$	$8\frac{4}{5}$ 5	$7\frac{7}{12}$ $2\frac{1}{12}$
3.	6 $3\frac{5}{8}$	$7\frac{1}{4}$ $3\frac{3}{4}$	3 $2\frac{1}{2}$	$7\frac{3}{10}$ $2\frac{9}{10}$	5 $4\frac{1}{4}$	$8\frac{1}{3}$ $4\frac{2}{3}$
4.	$9\frac{3}{5}$ $8\frac{4}{5}$	$8\frac{7}{8}$ $3\frac{1}{8}$	$10\frac{1}{10}$ $8\frac{9}{10}$	10 $5\frac{7}{12}$	4 $1\frac{13}{16}$	$12\frac{7}{10}$ $5\frac{3}{10}$
5.	$15\frac{1}{12}$ $6\frac{5}{12}$	$22\frac{1}{6}$ $6\frac{5}{6}$	$31\frac{1}{8}$ $13\frac{7}{8}$	$20\frac{15}{16}$ $9\frac{7}{16}$	$44\frac{3}{16}$ $17\frac{5}{16}$	$93\frac{11}{12}$ $86\frac{5}{12}$

Sam Gets Well



1. Sam had a bad cold. The doctor took Sam's temperature. The doctor said that when a person is well, his **normal temperature** is $98\frac{3}{5}°$. Sam's temperature was $100\frac{1}{5}°$. How many degrees above normal was Sam's temperature?

2. The doctor left some medicine for Sam to take every hour and a half. Sam took his medicine first at 9:30. When should he take it again?

3. Sam fell asleep that afternoon while his mother was reading to him. He woke up at 4 o'clock. His mother said, "Sam, you've been asleep for $\frac{3}{4}$ of an hour." At what time did Sam fall asleep?

4. The first night he was ill, Sam slept from 9 o'clock until 7 o'clock the next morning. How many hours did he sleep that night?

5. When Sam started to get well, his temperature was only $96\frac{4}{5}°$. How many degrees below normal ($98\frac{3}{5}°$) was it?

6. The doctor said that the highest Sam's temperature went was $4\frac{3}{5}°$ above normal. What was his temperature then?

7. Sam had to stay home from Tuesday, Feb. 9, until Thursday of the next week. What date did he go back to school?

Using Fractions

In some of these problems, you add fractions. In some, you subtract fractions. Number your paper 1 to 17. After each number, write A if you add to solve the problem; write S if you subtract. Write each answer after the letter. How many problems can you work as quickies?

1. Sue opened a 2-pound box of sugar. She used $\frac{3}{4}$ pound of the sugar to make cookies. How many pounds of sugar were left?

2. Nancy practiced her piano lesson $\frac{3}{4}$ hour this morning and $\frac{3}{4}$ hour this afternoon. How many hours did she practice today?

3. Sam caught a fish that was 11 inches long. Bob caught a fish $9\frac{1}{2}$ inches long. How many inches longer was Sam's fish than Bob's?

4. Dick had a board $8\frac{1}{4}$ feet long. He cut off a piece $2\frac{3}{4}$ feet long. How many feet of board did he have left?

5. Tom earns money cutting lawns for the neighbors. It took him $2\frac{1}{4}$ hours to cut one lawn and $1\frac{3}{4}$ hours to cut another. How many hours did it take him to cut both lawns?

6. Mary is $10\frac{1}{2}$ years old. Her little brother is just 5 years old. How many years older than her brother is Mary?

7. Mrs. Gray had $15\frac{7}{8}$ yards of cloth for window curtains. She used $7\frac{3}{8}$ yards of this cloth for curtains in one room. How many yards did she have left?

8. When Sally went to lunch in the cafeteria, she saw $4\frac{1}{6}$ pies behind the counter. When she came out there were only $1\frac{5}{6}$ pies left. How many pies had been sold while she was eating lunch?

9. Sue and Jill made three pans of candy for the food sale at school. The candy weighed $1\frac{7}{8}$ lb., $2\frac{3}{8}$ lb., and $2\frac{1}{8}$ lb. Find the total weight of the candy.

10. Bill is practicing jumping. A week ago he could jump only $8\frac{7}{12}$ feet. Today he jumped $11\frac{11}{12}$ feet. How many feet farther can he jump now than a week ago?

11. Mary's baby sister weighed $6\frac{3}{4}$ lb. when she was born. Now she weighs $13\frac{1}{4}$ lb. How many pounds has she gained in weight?

12. Mrs. Gray baked two cakes. She used $2\frac{1}{4}$ cups of flour for the first cake and $1\frac{3}{4}$ cups for the second cake. How many cups of flour did she use in all?

13. Sally bought $3\frac{3}{8}$ yards of cloth for a dress and $\frac{5}{8}$ yard for trimming. How many yards did she buy altogether?

14. Ken lives $1\frac{7}{10}$ miles north of the post office. Dick lives $2\frac{9}{10}$ miles south of the post office. How many miles is Ken's house from Dick's house?

15. Jane lives $5\frac{3}{10}$ miles east of the school. Jill lives on the same road, $3\frac{9}{10}$ miles east of the school. How far is it from Jane's house to Jill's house? (Drawing a map may help you.)

16. Dave wanted to find out how much his dog weighed. First Dave weighed himself. He weighed $83\frac{1}{2}$ pounds. Then he stepped on the scales with his dog in his arms. Together, Dave and his dog weighed 101 pounds. How many pounds did the dog weigh?

17. Bob sold two chickens to Mrs. Bell. One chicken weighed $3\frac{3}{8}$ pounds and the other chicken weighed $4\frac{7}{8}$ pounds. How many pounds of chicken did Bob sell?

Read the problems again. Are all your answers reasonable?

Some Quickies With Fractions

These problems are all quickies. Just tell the answers or write them on your paper.

1. Tom worked $\frac{1}{2}$ hour Friday night and $3\frac{1}{2}$ hours Saturday morning setting up his electric train. How many hours did he work in all?

2. Nancy practiced $\frac{3}{4}$ hour yesterday and $\frac{1}{4}$ hour today. How many hours did she practice both days?

3. Sue took a small pie to school and ate $\frac{1}{3}$ of it for lunch. She gave the rest away. What part of the pie did she give away?

4. Sue's mother bought 4 yards of cloth to make Sue a dress. After she made the dress, she found she had $\frac{1}{2}$ yard of cloth left. How many yards did she use?

5. Bob is riding to town on his bicycle. Town is $10\frac{1}{4}$ miles from Bob's house, and Bob has ridden $6\frac{1}{4}$ miles. How much farther does he have to go?

6. When Don measured his bean plants the other day, they were only $3\frac{1}{2}$ inches tall. Today they are 5 inches tall. How many inches have they grown?

7. Sue is making two batches of cookies. She needs $\frac{2}{3}$ cup sugar for each batch. How much sugar does she need for all the cookies?

8. We took 5 pies to the class picnic. There were $1\frac{1}{6}$ pies left after the picnic was over. How many pies did we eat at the picnic?

9. Last year, Don set out some baby pine trees. They were only $5\frac{1}{2}$ inches tall. This year the trees grew $1\frac{1}{2}$ inches. How tall are they now?

10. Jill is $\frac{3}{4}$ inch taller than Sue. If Sue is $56\frac{3}{4}$ inches tall, how tall is Jill?

11. Last week, Bob sold $1\frac{1}{2}$ dozen eggs to Mrs. Smith and $2\frac{1}{2}$ dozen to Mrs. Denton. How many dozen eggs did he sell to both customers?

12. Sally bought a half dozen sugar cookies, a half dozen ginger cookies, and a dozen and a half oatmeal cookies. How many dozens of cookies did she buy?

13. Linda's brother Terry is 17 years old. Linda is $11\frac{1}{2}$ years old. How many years older is Terry than Linda?

14. Sally is sending off two packages. One weighs $4\frac{3}{8}$ lb. and the other weighs $2\frac{5}{8}$ lb. How much do the two packages weigh together?

15. Sam and Bob had a snail race. Sam's snail crawled $7\frac{1}{4}$ inches. Bob's snail crawled $6\frac{3}{4}$ inches. By how many inches did Sam's snail win?

16. It is $2\frac{1}{10}$ miles to the crossroad from Bob's house and $2\frac{3}{10}$ miles farther on to Sam's house. How far does Bob live from Sam? (Draw a map if you need to.)

17. Sue made $3\frac{1}{2}$ pounds of candy to sell. Mrs. Clark bought $1\frac{1}{2}$ pounds of it. How many pounds were left?

18. After lunch was over at school, $\frac{5}{6}$ of an apple pie and $1\frac{1}{6}$ cherry pies were left. How many pies were left?

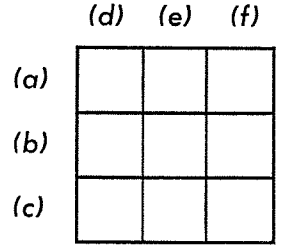
19. Jean bought $\frac{3}{4}$ pound of white peppermints and $\frac{3}{4}$ pound of pink peppermints for her party. How many pounds of peppermints did she buy?

20. Sam and Dick went fishing. The largest fish Sam caught was $10\frac{3}{8}$ inches long. Dick's longest fish was only $8\frac{5}{8}$ inches. How much longer than Dick's fish was Sam's fish?

Look over your answers. Do they seem sensible?

Cross-Number Squares

See if you can fill these cross-number squares. They are done like crossword puzzles, but you use figures instead of letters.



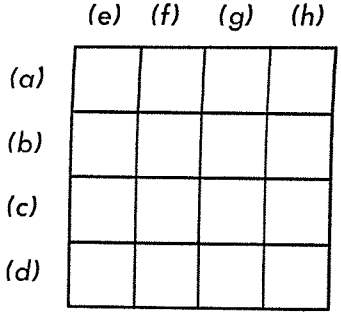
1. Copy the square at the left. Work the three following examples marked Across, and write the answers across your square. Then do the three examples marked Down. If your work is right, your answers down will already be written correctly in the squares. If your answers don't check, find your mistake and correct it.

Across: *(a)* 1441 − 575 *(b)* 18711 ÷ 63 *(c)* 23751 ÷ 39
Down: *(d)* 4535 − 3709 *(e)* 15 × 46 *(f)* 585 + 94

2. Now fill another cross-number square. Copy the square above again and fill it with the answers to the following examples.

Across: *(a)* 53156 ÷ 97 *(b)* 7200 ÷ 15 *(c)* 10500 ÷ 28
Down: *(d)* 2531 − 1988 *(e)* 89 + 398 *(f)* 23 × 35

3. Copy the square below and use the examples to the right of it. Do all your answers check?



Across

(a) 9826 − 3627
(b) 956 + 5882
(c) 78 × 96
(d) 27 × 305

Down

(e) 3589 + 3089
(f) 2651 − 809
(g) 14778 − 5395
(h) 15 × 659

Two-Step Problems

There is a hidden question in each problem on this page. You must find this question and answer it before you can answer the written question.

1. Jean had $3.42 in her bank. She spent 75 cents of this for a birthday present for her father. The next day she put $1 into her bank. How much money did she have in her bank then?

2. In three weeks, Tom earned $1.60, $2.40, and $1.85. How much a week did he earn, on the average?

3. Bob and Sue are saving for a radio. Bob has saved $5.80. Sue says she has saved half as much as Bob. How much have both of them saved together?

4. In the auditorium of Sally's school, there are 28 rows of seats with 16 seats in each row. At an assembly period, all but 19 seats were filled. How many people were there?

5. The heights of the five boys on Bill's basketball team are 58 inches, 62 inches, 64 inches, 59 inches, and 62 inches. What is their average height?

6. Mr. Lane bought 8 gallons of gasoline for his car, at 26 cents a gallon. He paid for it with a five-dollar bill. How much change should he have got?

7. For our watermelon party, we want to buy 3 watermelons costing 90 cents each. If 6 boys are to share the cost equally, how much should each boy pay?

8. The Lanes drove from Pleasant City to Reedsville. Jean watched the map. It was 15 miles from Pleasant City to Fairview, then 17 miles to Norwood, then 15 miles to Oakland, then 23 miles to Reedsville. The trip took two hours. How many miles an hour did the Lanes average?

Which Two Processes?

To solve each of these problems, you must use *two* processes. In Problem 1, you subtract and divide. In Problem 2, you add and multiply. Number your paper 1 to 17. After each number, write letters to show which two processes you use in that problem. So, for Problem 1 you write "1. S D." After the letters, write the answer to each problem.

1. Four boys are earning money to buy a six-dollar soccer ball. They have earned $3.84. How much more money must each boy earn?

2. Nineteen pupils in our room and 18 pupils in Miss Blake's room have ordered bottles of milk. If milk costs 5 cents a bottle, how much milk money should be collected from the pupils in both rooms?

3. Jerry made up 20 packets of stamps with 12 stamps in each packet. He sold 7 packets. How many stamps are there in the packets that are left?

4. Nora has 83 books to put on three shelves. If she puts 29 books on the first shelf and 35 books on the second shelf, how many books will be left for the third shelf?

5. On a 4-day trip we spent $13.48 for gasoline. Our other expenses averaged $9.75 a day. How much a day did our trip cost, including gasoline?

6. One week, Nora read to her grandfather for 12 hours. He paid her 25 cents an hour. Nora plans to spend one fourth of this money for books. How much will she spend?

7. Sam's family started on a 148-mile trip to Clinton at 7:30 a.m. They got to Clinton at 11:30. On the average, how many miles an hour did they drive?

8. At the store, baseballs were reduced from \$2 to \$1.48. Bill's baseball team bought six baseballs at the lower price. How much money did they save?

9. There are 258 pages in the book Nora is reading. She has read 83 pages. If she reads 25 pages an hour, how many hours will it take Nora to finish the book?

10. Ellen bought $\frac{3}{4}$ lb. of candy mints and $1\frac{1}{4}$ lb. of mixed chocolates for her party. How much did she pay for all the candy, if it cost 75 cents a pound?

11. Bob's hens laid 159 eggs last week and 189 eggs this week. How many dozen eggs did Bob get in both weeks?

12. One week, Bob got 53 cents a dozen for 13 dozen eggs. He sold \$5.80 worth of chickens. How much money did Bob take in that week?

13. On Saturday, Bob sold three chickens. He got \$1.44 for the first chicken, \$2.06 for the second chicken, and \$1.78 for the third chicken. How much did he get per chicken, on the average?

14. Sue and Jill were making candy to raise money for a class party. Sue's mother gave them $5\frac{1}{2}$ pounds of sugar and Jill's mother gave them $7\frac{1}{2}$ pounds. They used 9 pounds in making their candy. How many pounds of sugar were left?

15. Mrs. Lane took Jean and Tony to the movies. Mrs. Lane's ticket cost 75 cents. Tickets for Jean and Tony were 45 cents each. How much did Mrs. Lane pay for the three tickets to the movies?

16. Tom's mother bought Tom 3 shirts priced \$1.80 each. The clerk said, "We are selling all shirts today at $\frac{1}{10}$ off." How much did Tom's mother save on all 3 shirts?

Pages 292 and 293 provide enrichment material which can be used after this page.

Questions for Two-Step Problems

Finish each of the problems on this page with a question that will make it a two-step problem. Then work the problem. Write your questions and the answers on your paper.

1. Tom earned 75 cents for cutting the grass, $1.10 for washing the car, and 65 cents for weeding the flower garden. He spent $1.18 of the money he earned for a birthday present for his mother.

2. Sally bought 3 pounds of meat at 69 cents a pound and a loaf of bread for 18 cents.

3. Bill's baseball team played three games last week. In the first game they scored 17 runs, in the second game 6 runs, and in the third game 14 runs.

4. Six boys put in 15 cents apiece to buy a watermelon. The watermelon they wanted cost one dollar.

5. On a 700-mile trip, the Lanes drove 193 miles the first day and 308 miles the second day.

6. Tom worked $\frac{3}{4}$ hour cleaning rugs and $2\frac{1}{4}$ hours cutting the lawn. His father paid him 35 cents an hour.

7. Jerry is mailing a package that will take 24 cents' worth of postage. He has a 15-cent stamp and some 3-cent stamps.

8. Sally's mother sent her to the store with 50 cents to buy some apples. The apples Sally liked were priced 3 pounds for 25 cents.

9. Allen wants a flash kit for his camera. It costs $3.65. Allen has saved 75 cents for it. His father said he would pay half of the money that Allen still needs to buy the flash kit.

Can You Find the Missing Numbers?

1. What number is 37 more than 13?
2. What number is 15 less than 100?
3. What number is one fourth of 52?
4. What number is 6 times as large as 15?
5. What fraction is $\frac{1}{8}$ more than $\frac{3}{8}$?
6. What fraction is $\frac{1}{8}$ less than $\frac{3}{8}$?
7. What number must be added to 16 to make 25?
8. What number must be subtracted from 40 to give 28?
9. What fraction must be added to $\frac{1}{4}$ to make 1 whole?
10. What fraction must be subtracted from 1 to leave $\frac{5}{8}$?
11. How many 9's are there in 108?
12. How much larger is 75 than 48?
13. How much smaller is 16 than 30?
14. Sixty is how many times as large as 15?
15. Thirty-six divided by what number equals 4?
16. Eight times what number equals 48?

Copy the following examples and fill in the missing numbers.

	a	*b*
17.	$16 + 48 = ?$	$103 - 26 = ?$
18.	$\frac{1}{3}$ of $54 = ?$	$5 \times 25 = ?$
19.	$\frac{5}{8} + \frac{1}{8} = ?$	$\frac{7}{12} - \frac{5}{12} = ?$
20.	$23 + ? = 42$	$64 - ? = 57$
21.	$\frac{1}{6} + ? = 1$	$1 - ? = \frac{1}{4}$
22.	$144 \div 8 = ?$	$87 - 29 = ?$
23.	$71 - 18 = ?$	$60 \div 12 = ?$
24.	$50 \div ? = 10$	$7 \times ? = 49$

Measures in Two-Step Problems

1. Bill's father likes to climb mountains on his vacation. Last summer he climbed a mountain 13,057 feet high. How many more feet than 2 miles high is this mountain?

To solve this two-step problem you must know that there are 5,280 feet in a mile.

In each of the following two-step problems you must know a measure number. See if you can solve any of the problems as quickies.

2. Sally is cutting arm bands to use in a play day at her school. How many arm bands, each 9 inches long, can she cut from a strip of cloth 3 yards long?

3. If a pint of ice cream serves 3 people, how many people can Ellen serve with 3 quarts of ice cream at her party?

4. The 3 quarts of ice cream Ellen bought for her party came in 1-pint bricks, costing 45 cents a pint. How much did Ellen pay for the 3 quarts?

5. The girls made 3 gallons of lemonade to serve the mothers who came to the school entertainment. Allowing 2 glasses to a pint, find how many glasses of lemonade they made. (How many pints are there in a gallon?)

6. This week Joe has practiced on his trumpet 35 minutes, 18 minutes, 23 minutes, and 20 minutes. How many more minutes than an hour has Joe practiced this week?

7. Sue made 3 pounds of candy for a candy sale. She put the candy in boxes, with 8 ounces in each box. How many boxes of candy were there?

8. This afternoon a coal truck brought 7725 pounds of coal to Jim's house. How many more pounds than 3 tons of coal did the truck bring?

9. Don's father can buy oil for his truck for 35 cents a quart or $1.08 a gallon. How much money does he save on each gallon of oil by buying it in gallon cans instead of by the quart?

10. If Peggy's pony eats 3 quarts of oats a day, how many days will 3 bushels of oats last?

11. Sue's mother says a beef roast should cook 20 minutes for each pound. How many hours should a 6-pound roast stay in the oven?

12. Dick has a board 40 inches long. If he cuts off a piece two feet long, how many inches will be left?

13. Nora's father was reading a book. Nora timed him and found he read 6 pages in 2 minutes. How many seconds did it take him to read a page, on the average?

14. While riding on the turnpike, Tony saw a sign saying "1000 yd. to next service station." Was it more or less than half a mile to the service station? How many feet?

Travel Arithmetic

1. One Saturday, Mrs. Gray took Bob and Sue on the train to the city. She paid $3.76 for her ticket. The children went for half fare; each of their tickets cost one half as much as Mrs. Gray's ticket. How much did she pay for the three tickets? (There is a short way to find how much the two half fares cost.)

2. The train the Grays took was supposed to leave at 8: 17 a.m., but the man who sold them their tickets said the train was half an hour late. At what time could they expect the train to leave?

3. Jerry went with his uncle on an airplane trip last summer to visit Jerry's grandparents. The plane went 2,220 miles in 12 hours. How many miles per hour did it average?

4. Jean's Aunt Kate went on a steamship from New York to England, a distance of 3264 sea miles. (A sea mile is a little longer than a mile on land.) The ship averaged 24 knots, that is, 24 sea miles per hour. How many hours did it take to make the trip? How many whole days did the trip take? How many hours over?

5. Linda's older brother Andy takes a bus to his work every morning. The bus fare is 15 cents. Andy can buy 8 bus tickets for $1.00. How much does he save by buying 8 tickets at one time instead of paying 8 fares separately?

6. Jim is going by train to visit his aunt in the city. According to the timetable, Jim's train will leave his home station at 2: 15 p.m., and arrive at the city at 3: 45 p.m. How long will the trip take?

7. On a long trip in their family car, Tony and Jean played a game of seeing how many different states the cars they met had come from. They saw license plates from 32 of the 48 states. What fractional part of the 48 states was this? (Be sure to reduce your answer to lowest terms.)

8. While traveling on a train, Tom and his parents ate their lunch in the dining car. Tom's lunch cost $1.55, his mother's lunch cost $1.20, and his father's lunch cost $1.75. Find the average cost of the lunch per person.

9. Last summer, the Lanes drove over a toll bridge to an island where they wanted to spend the week end. The toll for one way was 75 cents. Toll for the round trip was $1.35. How much did they save by paying toll for both ways at once?

10. On their whole trip, the Lanes paid these tolls on toll roads and toll bridges: $1.10, 50 cents, 75 cents, $1.35, and $1.10. On the average, how much toll did they pay each time?

11. One day, the Lanes started driving at 8: 30 a.m. They planned to drive 9 hours and take 1 hour for lunch. At what time would they finish their day's driving?

12. They used 37 gallons of gasoline in driving 666 miles. How many miles per gallon was this?

Can You Work With Numbers?

Diagnostic Check Test 3A

This test will help you check up on your skills in handling whole numbers and fractions.

Copy, divide, and check.

	a	b	c
1.	$73\overline{)\$32.85}$	$21\overline{)\$2.94}$	$36\overline{)7488}$
2.	$12\overline{)607}$	$67\overline{)9313}$	$94\overline{)52663}$

Do what the signs tell you to do.

	a	b
3.	$177 + 56 + 840 + 36$	$1690 - 953$
4.	$640 + 50 + 269 + 84 + 607$	$80 \times \$4.50$
5.	$\$4.34 + \$4.89 + \$7.39 + \$4$	$\$12 - \$9.05$
6.	$\$2.06 + 89¢ + \$5.87 + \$1.37$	506×805

Copy and finish these examples.

	a	b	c
7.	$\frac{3}{8} + \frac{7}{8} = ?$	$\frac{7}{10} + \frac{1}{10} = ?$	$\frac{1}{6} + \frac{5}{6} = ?$
8.	$\frac{3}{4} - \frac{1}{4} = ?$	$1 - \frac{3}{5} = ?$	$2 - \frac{1}{3} = ?$

Copy and add.

	a	b	c	d	e
9.	$4\frac{7}{10}$	$6\frac{5}{8}$	$10\frac{3}{4}$	$4\frac{3}{4}$	6
	$3\frac{1}{10}$	$4\frac{7}{8}$	$5\frac{3}{4}$	$1\frac{1}{4}$	$8\frac{5}{16}$

Copy and subtract.

10.	$3\frac{4}{5}$	$5\frac{1}{6}$	$20\frac{3}{8}$	$51\frac{1}{16}$	47
	$1\frac{2}{5}$	$4\frac{5}{6}$	$7\frac{5}{8}$	$49\frac{5}{16}$	$18\frac{3}{4}$

Do You Understand Numbers?

Diagnostic Check Test 3B

This test will show you how much you have learned about the meaning of numbers and arithmetic words.

1. Write "four thousand eight" in figures.
2. Write "fifty dollars and three cents" in figures.
3. In the number 3876, what is the value of the 8?
4. How many thousands are there in one million?
5. How many millions are there in the number 130000000?
6. Write the largest four-figure number you can, using the figures 2, 5, 8, 9.
7. What two subtraction facts belong with $9 + 6 = 15$?
8. What two division facts belong with $8 \times 7 = 56$?
9. Sixteen is how many times as large as 2?
10. Twenty is how much more than 13?
11. What measure is $\frac{1}{3}$ of a yard?
12. A quart is what fraction of a gallon?
13. What fractional part of 24 is 16?
14. Change $\frac{9}{4}$ to a mixed number.
15. Change $\frac{8}{12}$ to its lowest terms.
16. Write the fraction with the numerator 7 and the denominator 8.
17. Write $\frac{1}{4}$, $\frac{1}{8}$, and $\frac{1}{2}$ in the order of their value, the smallest first.
18. How many minutes are there in $\frac{3}{4}$ hour?
19. Which is more, $\frac{3}{4}$ dozen or $\frac{2}{3}$ dozen?
20. How many feet and inches are there in 52 inches?

Can You Use Arithmetic?

Diagnostic Check Test 3C

This test will show you how well you can use the arithmetic you have learned in solving problems.

1. Bob sold 15 chickens for $16.20. How much was this for each chicken, on the average?

2. It is 70° in the house and 24° outdoors. How much warmer is it in the house than outdoors?

3. There were 78 Boy Scouts at Bill's Scout camp. One evening 32 visitors came for campfire. How many persons were at campfire that night?

4. How much must a baseball team pay for 15 baseballs costing $1.89 each? (Estimate your answer first by multiplying $2 by 15.)

5. Tom has started to sell weekly magazines. In three weeks he sold 28, 34, and 40 magazines. Find the average number he sold each week.

6. Ann went to Jean's house to stay 2 hours. She has been there for 45 minutes. How many minutes longer may she stay?

7. In the city where Jean lives, 8 blocks make 1 mile. How many feet long is each block?

8. A train is due to arrive at 3:48. It is 20 minutes late. At what time will it arrive?

9. Nora got $5 for her birthday. She bought a book for $1.25 and a scarf for 95 cents. How much money did she have left?

10. If Tom saves $3 every month, how much will he save in two years?

Are all your answers sensible?

Using Parcel Post

1. Don has made out an order for a garden tool set he wants to have a store send to him by parcel post. The shipping weight of the set of tools is 2 lb. 4 oz. Don looked up the parcel post rates for the distance he lived from the store. They are shown in the table at the right.

Parcel Post Rate Table	
Shipping Weight	*Postage*
1 lb. 1 oz. to 2 lb.	27¢
2 lb. 1 oz. to 3 lb.	31¢
3 lb. 1 oz. to 4 lb.	35¢
4 lb. 1 oz. to 5 lb.	39¢
5 lb. 1 oz. to 6 lb.	43¢
6 lb. 1 oz. to 7 lb.	47¢

Don's order weighs between 2 lb. 1 oz. and 3 lb. Find from the table how much postage he will have to pay. If the set of tools cost $1.98, how much money (including postage) must Don send with his order?

2. After he received the set of tools, Don ordered from the same store a length of plastic hose for watering his garden. The shipping weight of the hose was just 6 lb. The price of the hose was $6.65. Find the total cost of the hose and the postage.

3. Sam lives the same distance from the store that Don does, so he pays the same parcel post rate. Sam ordered a fishing rod weighing 1 lb. and costing $2.49, and a reel weighing 12 oz. and costing $3.19. They were both to be shipped in one package. How much money, including postage, did Sam send with his order?

4. Find how much money Don's mother must send with an order for $19.98 worth of clothing, if the shipping weight is 4 lb. 9 oz.

5. Find the total cost of an order Don's father sent for $30.27 worth of goods, weighing 6 lb. 5 oz.

Estimating With Round Numbers

Estimate	*Exact*
$10.00	$10.00
7.00	6.89
$ 3.00	$ 3.11

1. Bill has $10. He wants to buy a sweater costing $6.89. He would like to know how much money he will have left.

First, he thinks that $6.89 is *about* seven dollars. Then he estimates how much money he will have left by subtracting $7 from $10. He will have *about* $3 left.

To find the exact amount he will have left, Bill subtracts $6.89 from $10.00. Is the exact amount more or less than the estimate? How much?

How do you think estimating may have been useful to Bill?

2. In round numbers, $3.29 is $3 to the nearest dollar. What is $7.98 to the nearest dollar?

3. Write each of the following numbers to the nearest dollar: *(a)* $9.75 *(b)* $2.06 *(c)* $4.86 *(d)* $13.24

4. Is $8.48 nearer $8 or $9?

5. Is $33.53 nearer $33 or $34?

6. When you see a price of $8.99 in a store, of how many dollars do you think?

7. Of how many dollars does each of these prices make you think?

(a) $4.95 *(b)* $14.89 *(c)* $7.13 *(d)* $19.99

8. Is 651 nearer 600 or 700?

9. Write each of these numbers in round numbers to the nearest hundred:

(a) 543 *(b)* 1362 *(c)* 2028 *(d)* 2993

10. If you were estimating, how would you think of the number 14,987?

For each of the following problems, write two answers: first your estimate, then the exact answer. See how close your estimate came to the exact answer.

11. Mrs. Lane bought groceries costing $3.83. She gave the clerk $5.00. Estimate her change to the nearest dollar, then find the exact change.

12. Nora bought three books. She paid $1.97, $2.12, and $2.87 for them. Estimate the total cost by adding the three prices, each expressed as the nearest dollar. Then find the exact answer.

13. Tom earned $11.76 in 4 weeks. How much a week did he earn on the average?

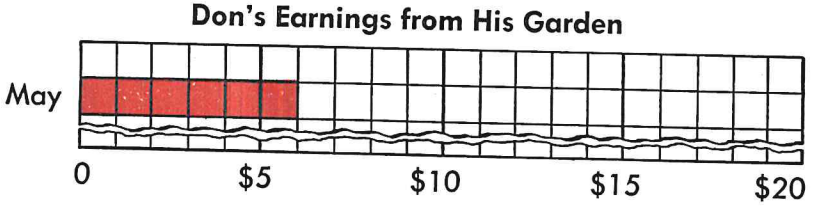
14. On a trip, we drove 867 miles in 3 days. How many miles did we drive each day on the average?

15. If an airplane goes 275 miles an hour, how many miles will it go in four hours?

16. On a 413-mile trip, the Lanes have driven 195 miles. How many miles do they still have to drive?

Pages 294 and 295 provide enrichment material which can be used after this page.

Using Round Numbers in Graphs



1. Don made a bar graph to keep a record of how much money he made from his garden. Each square in his graph stood for $1.

In May, Don earned $5.79. The picture above shows how Don made the bar for May. Since $5.79 is about $6, Don shaded 6 spaces.

See if you can make Don's graph. You can draw the bars on squared paper (called "graph paper") or you can rule some paper yourself, making room for six bars. At the left, write May, June, July, August, Sept., and Oct. Below the graph write 0, $5, $10, $15, and $20.

In June, Don earned $8.95. How many squares should you shade to make the bar for June?

Don took in $12.05 in July, $18.86 in August, $16.10 in Sept., and $10.04 in Oct. How many squares should you shade in making the bar for each of these months?

Your graph will help you answer the questions below.

2. In what month did Don earn about twice as much as in May?

3. In what month did Don get the most money?

4. In what month did he get the smallest amount?

5. About how much more did Don get from his garden in August than in June?

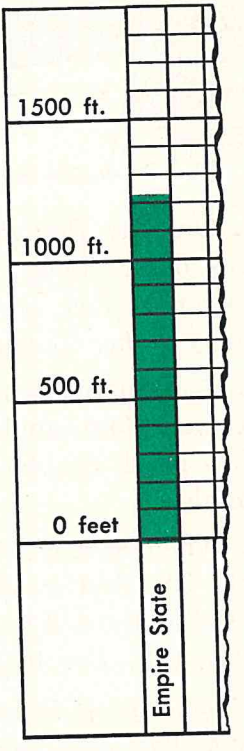
6. About how much did Don receive in all six months?

7. Make another bar graph like that on page 186 to show Jill's earnings for these months: June, $4.09; July, $9.75; August, $12.20; September, $10.15; October, $5.90.

a. In what month did Jill earn about 3 times as much as in June?

b. In what 2 months were her earnings about the same?

8. Ann made a graph for her social studies booklet to show the heights of some well-known buildings in the United States. The picture at the right shows how Ann started her graph. Each square stands for 100 feet. The Empire State Building in New York is 1,250 ft. high, so Ann filled in $12\frac{1}{2}$ squares.



Heights of Buildings

Make a graph like Ann's to show the heights of five buildings, including the Empire State Building.

a. The Chrysler Building in New York is 1,046 ft. high. This is about 1,050 ft. How many squares do you fill in?

b. The Woolworth Building in New York is 792 ft. high. How many feet is this to the nearest hundred? How many squares do you fill in?

c. The Singer Building in New York is 612 ft. high. How many squares do you fill in?

d. The Union Central Building in Cincinnati, Ohio, is 495 ft. high. How many squares do you fill in?

e. The Woolworth Building is *about* how many feet higher than the Union Central Building?

Sam's Fishing

1. One day, Bob went fishing with Sam. Bob's fishing pole was 6 feet long. Sam's was $4\frac{2}{3}$ feet long. How much longer, in feet, was Bob's fishing pole than Sam's? How many *inches* longer was Bob's pole?

2. Bob caught two fish. They weighed $2\frac{1}{4}$ pounds and $1\frac{1}{4}$ pounds. Sam caught only one fish, but it weighed 4 pounds. How much heavier was Sam's fish than the two fish Bob caught?

3. When Sam went fishing another time, he caught three fish. The first weighed $2\frac{3}{4}$ pounds, the second $3\frac{1}{4}$ pounds, and the third $3\frac{3}{4}$ pounds. Find the total weight of the three fish. See if you can do this problem as a quickie.

4. The largest fish Sam caught last summer was $18\frac{3}{4}$ in. long. This year he caught a fish $20\frac{1}{4}$ in. long. How much longer was the fish he caught this year than the fish he caught last year?

5. Whenever Sam fished, he threw back into the water any fish he caught that was less than 10 inches long. One day he caught a fish $8\frac{7}{8}$ inches long. How much too short was it?

6. Sam guessed that a fish he caught weighed 3 pounds. When he weighed it, he found that it weighed only $2\frac{3}{8}$ pounds. How much less did the fish weigh than Sam guessed it did? How many ounces is this? (Remember, $\frac{1}{8}$ pound is $\frac{1}{8}$ of 16, or 2 ounces.)

Last summer, Sam's father took him to the mountains to fish for trout. They took this table with them to estimate how much trout of different lengths weighed.

Weight of Trout

Length	Weight
9 in.	5 oz.
10 in.	7 oz.
11 in.	9 oz.
12 in.	12 oz.
13 in.	15 oz.
14 in.	1 lb. 3 oz.
15 in.	1 lb. 7 oz.
16 in.	1 lb. 12 oz.
17 in.	2 lb. 2 oz.
18 in.	2 lb. 8 oz.
19 in.	2 lb. 15 oz.
20 in.	3 lb. 7 oz.

7. Sam caught a trout 16 inches long. Find its weight in the table.

Find the weights of these fish that Sam and his father caught.

8. 11 inches long

9. 19 inches long

10. 15 inches long

11. 17 inches long

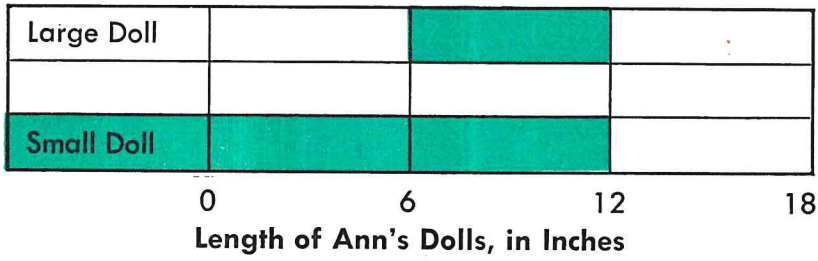
12. How much heavier is a trout 13 inches long than a trout 9 inches long? What fraction of a pound is this?

13. One day, Sam and his father went fishing in a large lake. They rented an outboard-motor boat for $1.50 an hour. They used the boat from 9 a.m. to 5 p.m. How much did they have to pay for renting the boat?

14. Sam wanted to buy a rod and reel. The fishing tackle he likes best costs $10.95 for the rod and $8.95 for the reel. A cheaper outfit costs $2.49 for the rod and $3.19 for the reel. How much more does the better outfit cost?

Comparing Numbers

These problems show different ways of comparing numbers. See how many you can work as quickies.



Length of Ann's Dolls, in Inches

1. Ann collects dolls. She has a large doll 18 inches long, and a small doll only 6 inches long. The graph shows how these lengths compare.

a. The small doll is how much *shorter* than the large doll?

b. The large doll is how many *times* as long as the small doll?

c. The length of the small doll is what *fraction* of the length of the large doll?

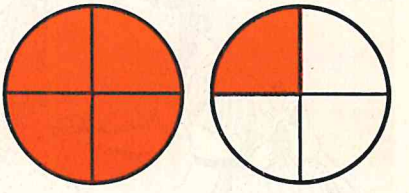
2. Sam caught an eel 24 inches long. He caught a trout 9 inches long. Draw a bar graph to show the lengths of the two fish. Let each space across stand for 3 inches. The length of the trout is what fraction of the length of the eel? $\frac{9}{24} = ?$

3. Peggy is 12 years old. Her cousin Doris is 24 years old. Doris is ? years older than Peggy. She is ? times as old as Peggy. Peggy is only ? as old as Doris.

4. Peggy weighs 90 pounds. Her pony weighs 360 pounds. The pony weighs ? pounds more than Peggy. It weighs ? times as much as Peggy. Peggy weighs ? as much as the pony.

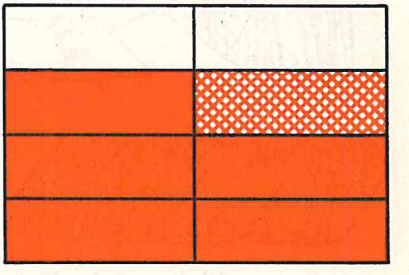
Showing Fractions

This page will help you *see* some things you have been doing with fractions, so you can understand fractions better.



1. The 2 circles at the right have been colored to show $2 - 1\frac{1}{4}$. $2 - 1\frac{1}{4} = ?$

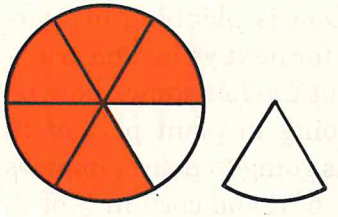
2. On your paper, draw two squares. Shade them to show $2 - 1\frac{1}{2}$. $2 - 1\frac{1}{2} = ?$



3. The rectangle at the right has been colored to show $\frac{5}{8} + \frac{1}{8}$. $\frac{5}{8} + \frac{1}{8} = ?$

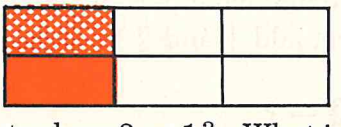
4. Draw a rectangle and divide it into eighths. Shade it to show $\frac{3}{8} + \frac{1}{8}$. $\frac{3}{8} + \frac{1}{8} = ?$

5. Draw a circle on your paper by drawing a line around a coin. Divide your circle into fourths. Shade it to show $\frac{1}{4} + \frac{1}{4}$. $\frac{1}{4} + \frac{1}{4} = ?$



6. At the left are $1\frac{1}{6}$ circles. $\frac{5}{6}$ of a circle has been colored to show $1\frac{1}{6} - \frac{5}{6}$. $1\frac{1}{6} - \frac{5}{6} = ?$

7. The rectangle has been colored to show $\frac{1}{6} + \frac{1}{6}$. $\frac{1}{6} + \frac{1}{6} = ?$

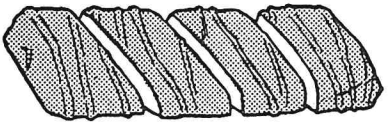


8. Draw 2 squares. Shade them to show $\frac{7}{8} + \frac{5}{8}$. What is the sum of $\frac{7}{8}$ and $\frac{5}{8}$?

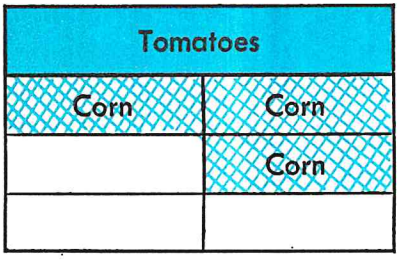
9. Draw two circles. Shade them to show $2 - 1\frac{3}{8}$. What is the remainder when you subtract $1\frac{3}{8}$ from 2?

10. Draw 3 rectangles. Shade them to show $1\frac{1}{6} + 1\frac{5}{6} = ?$

Changing Fractions To Add



1. Jean had a candy bar. She ate $\frac{1}{4}$ of it and gave $\frac{1}{2}$ of it to Ann and Ellen. To find what part of the bar was gone, add $\frac{1}{4}$ and $\frac{1}{2}$. Before you can add these fractions, you must think of $\frac{1}{2}$ as $\frac{2}{4}$. Then you add $\frac{1}{4}$ and $\frac{2}{4}$. What fraction of the bar was gone?



2. Don is planning his garden for next year. The drawing at the left shows how he is going to plant part of it. He is going to plant tomatoes in $\frac{1}{4}$ of it and corn in $\frac{3}{8}$ of it.

To find what part of Don's garden will be in tomatoes and corn, add $\frac{1}{4}$ and $\frac{3}{8}$. Change $\frac{1}{4}$ to $\frac{2}{8}$, then add $\frac{2}{8}$ and $\frac{3}{8}$.

$$\frac{1}{4} + \frac{3}{8} = \frac{2}{8} + \frac{3}{8} = ?$$

3. What is the sum of $\frac{1}{4}$ and $\frac{1}{8}$?

4. What is the sum of $\frac{1}{4}$ and $\frac{5}{8}$?

5. Sue had measured $\frac{1}{2}$ cup of sugar for a recipe. Her mother told her to put in $\frac{1}{8}$ cup more.

To find what fraction of a cup Sue had then, add $\frac{1}{2}$ and $\frac{1}{8}$. First change $\frac{1}{2}$ to $\frac{4}{8}$, then add the numerators.

$$\frac{1}{2} = \frac{4}{8}$$
$$\frac{1}{8} = \frac{1}{8}$$
$$\frac{5}{8}$$

When you change $\frac{1}{2}$ to $\frac{2}{4}$, or $\frac{1}{4}$ to $\frac{2}{8}$, or $\frac{1}{2}$ to $\frac{4}{8}$, you change the fractions to higher terms.

To change a fraction to **higher terms,** multiply both the numerator and the denominator by the same number.

6. By what number do you multiply both terms to change $\frac{1}{2}$ to twelfths? To change $\frac{2}{3}$ to twelfths?

	a	*b*	*c*	*d*
7.	$\frac{1}{2} = \frac{?}{6}$	$\frac{1}{3} = \frac{?}{6}$	$\frac{2}{3} = \frac{?}{6}$	$\frac{3}{4} = \frac{?}{8}$
8.	$\frac{1}{2} = \frac{?}{12}$	$\frac{1}{3} = \frac{?}{12}$	$\frac{3}{4} = \frac{?}{12}$	$\frac{2}{3} = \frac{?}{12}$

9. Bob sold $\frac{3}{4}$ doz. eggs to one customer and $\frac{1}{2}$ dozen to another customer. To find how many dozen eggs he sold, add $\frac{3}{4}$ and $\frac{1}{2}$. Change your answer to a mixed number. How many dozen eggs did Bob sell?

$$\frac{3}{4} = \frac{3}{4}$$
$$\frac{1}{2} = \frac{2}{4}$$
$$\frac{5}{4} = 1\frac{1}{4}$$

Copy and add.

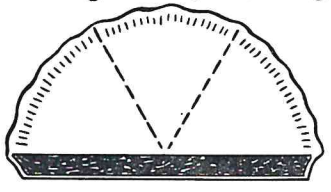
	a	*b*	*c*	*d*	*e*
10.	$\frac{5}{8}$ $\frac{1}{4}$	$\frac{1}{2}$ $\frac{3}{8}$	$\frac{1}{2}$ $\frac{1}{6}$	$\frac{1}{6}$ $\frac{2}{3}$	$\frac{1}{3}$ $\frac{1}{6}$
11.	$\frac{1}{2}$ $\frac{5}{8}$	$\frac{7}{8}$ $\frac{1}{4}$	$\frac{1}{2}$ $\frac{7}{8}$	$\frac{3}{4}$ $\frac{3}{8}$	$\frac{5}{8}$ $\frac{3}{4}$
12.	$\frac{1}{4}$ $\frac{7}{12}$	$\frac{5}{12}$ $\frac{1}{2}$	$\frac{1}{3}$ $\frac{5}{12}$	$\frac{7}{12}$ $\frac{2}{3}$	$\frac{3}{4}$ $\frac{11}{12}$

Changing Fractions To Subtract

1. In Ellen's city, 8 blocks make a mile, so each block is $\frac{1}{8}$ mile long. Ellen, Ann, and Nancy live on the same street. Ann lives $\frac{1}{4}$ mile east of Ellen. Nancy lives $\frac{7}{8}$ mile east of Ellen. (Can you draw a map to show this?)

Saturday morning, Ellen started to walk from her house to Nancy's house. When she got to Ann's house, what part of a mile did she still have to walk?

To find out, subtract $\frac{1}{4}$ from $\frac{7}{8}$. Think of $\frac{1}{4}$ as $\frac{2}{8}$. Then subtract $\frac{2}{8}$ from $\frac{7}{8}$. $\frac{7}{8} - \frac{2}{8} = ?$



2. For lunch, Sally's mother served a pie, cut in 6 pieces. Half the pie was eaten. When Sally got home from school, her mother said she could have $\frac{1}{6}$ of the pie. To find what fraction of the whole pie would be left, subtract $\frac{1}{6}$ from $\frac{1}{2}$.

$\frac{1}{2} - \frac{1}{6} = \frac{3}{6} - \frac{1}{6} = ?$ Is your answer in lowest terms?

3. Mrs. Gray gave Sue $\frac{7}{8}$ cup of sugar to use in making cookies. Sue needed only $\frac{1}{2}$ cup of sugar for her cookies. To find what fraction of a cup would be left, subtract $\frac{1}{2}$ from $\frac{7}{8}$. Change $\frac{1}{2}$ to eighths before you subtract. How much sugar would Sue have left?

$$\begin{array}{r} \frac{7}{8} = \frac{7}{8} \\ \frac{1}{2} = \frac{4}{8} \\ \hline \frac{3}{8} \end{array}$$

4. Nancy promised to practice her piano lesson for three quarters of an hour. She has practiced for half an hour. What part of an hour must she still practice? $\frac{3}{4} - \frac{1}{2} = ?$

5. It is $\frac{9}{10}$ of a mile from Dick's house to the store. Dick has gone $\frac{1}{2}$ mile toward the store. What fraction of a mile must he still go? $\frac{9}{10} - \frac{1}{2} = \frac{9}{10} - \frac{5}{10} = ?$

6. By what number do you multiply both terms of $\frac{2}{3}$ to change $\frac{2}{3}$ to ninths? To change $\frac{3}{4}$ to sixteenths? To change $\frac{3}{5}$ to tenths?

Copy these fractions and change them to higher terms.

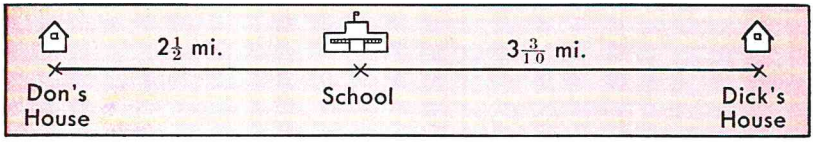
	a	*b*	*c*	*d*
7.	$\frac{1}{5} = \frac{?}{10}$	$\frac{4}{5} = \frac{?}{10}$	$\frac{2}{3} = \frac{?}{9}$	$\frac{1}{2} = \frac{?}{16}$
8.	$\frac{1}{4} = \frac{?}{16}$	$\frac{5}{8} = \frac{?}{16}$	$\frac{3}{8} = \frac{?}{16}$	$\frac{7}{8} = \frac{?}{16}$

Copy and subtract.

	a	*b*	*c*	*d*	*e*
9.	$\frac{1}{2}$ $\frac{3}{8}$	$\frac{5}{8}$ $\frac{1}{2}$	$\frac{3}{4}$ $\frac{1}{8}$	$\frac{7}{8}$ $\frac{3}{4}$	$\frac{3}{4}$ $\frac{3}{8}$
10.	$\frac{1}{2}$ $\frac{1}{4}$	$\frac{5}{6}$ $\frac{1}{3}$	$\frac{5}{6}$ $\frac{1}{2}$	$\frac{5}{12}$ $\frac{1}{3}$	$\frac{7}{12}$ $\frac{1}{4}$
11.	$\frac{11}{12}$ $\frac{1}{2}$	$\frac{3}{4}$ $\frac{7}{12}$	$\frac{4}{9}$ $\frac{1}{3}$	$\frac{8}{9}$ $\frac{2}{3}$	$\frac{9}{10}$ $\frac{1}{2}$
12.	$\frac{4}{5}$ $\frac{3}{10}$	$\frac{1}{2}$ $\frac{1}{10}$	$\frac{3}{8}$ $\frac{1}{16}$	$\frac{7}{16}$ $\frac{1}{4}$	$\frac{1}{2}$ $\frac{5}{16}$

Pages 296 and 297 provide enrichment material which can be used after this page.

Adding Mixed Numbers



$$2\tfrac{1}{2} = 2\tfrac{5}{10}$$
$$3\tfrac{3}{10} = 3\tfrac{3}{10}$$
$$5\tfrac{8}{10} = 5\tfrac{4}{5}$$

1. Don's house is $2\frac{1}{2}$ miles from school. Dick's house is $3\frac{3}{10}$ miles from school in the opposite direction. To find how far apart the two boys live, add $2\frac{1}{2}$ and $3\frac{3}{10}$.

Change the fractions to tenths and add. Reduce the fraction in the sum to lower terms. How many miles does Dick live from Don?

Copy and add these mixed numbers.

	a	b	c	d	e
2.	$2\frac{3}{8}$	$1\frac{1}{4}$	$3\frac{2}{3}$	$3\frac{1}{2}$	$2\frac{1}{6}$
	$1\frac{1}{2}$	$1\frac{5}{8}$	$4\frac{1}{6}$	$3\frac{1}{4}$	$2\frac{1}{3}$
3.	$1\frac{1}{5}$	$2\frac{1}{2}$	$1\frac{7}{12}$	$4\frac{1}{2}$	$6\frac{1}{3}$
	$2\frac{3}{10}$	$4\frac{1}{10}$	$3\frac{1}{4}$	$3\frac{5}{12}$	$2\frac{1}{12}$

$$4\tfrac{7}{8} = 4\tfrac{7}{8}$$
$$3\tfrac{3}{4} = 3\tfrac{6}{8}$$
$$7\tfrac{13}{8} = 8\tfrac{5}{8}$$

4. Sam and Bob weighed the fish they caught one day. Sam's fish weighed $4\frac{7}{8}$ pounds. Bob's fish weighed $3\frac{3}{4}$ pounds. To find the total weight of the fish the boys caught, add $4\frac{7}{8}$ and $3\frac{3}{4}$.

Change the fractions to eighths and add. Change $\frac{13}{8}$ to a mixed number ($1\frac{5}{8}$) and add it to 7. How many pounds of fish did the boys catch?

A fraction like $\frac{13}{8}$ is called an **improper fraction.** The numerator of an improper fraction is equal to, or greater than, the denominator. $\frac{8}{8}$ and $\frac{11}{6}$ are improper fractions. Why?

Here are the steps you take when you add mixed numbers:

(1) If necessary, change all the fractions to similar fractions having the same denominators.

(2) Add the fractions first, then the whole numbers.

(3) If the sum of the fractions is an improper fraction, change the sum to a mixed number or a whole number, and add the whole number to the sum of the whole numbers.

(4) Make sure the fraction in your answer is in lowest terms.

Copy and add.

	a	b	c	d	e
5.	$2\frac{1}{2}$ $2\frac{5}{8}$	$1\frac{1}{2}$ $\frac{7}{8}$	$3\frac{5}{8}$ $4\frac{3}{4}$	$6\frac{5}{8}$ $4\frac{1}{4}$	$7\frac{5}{6}$ $2\frac{1}{2}$
6.	$2\frac{3}{10}$ $5\frac{1}{2}$	$3\frac{4}{5}$ $1\frac{7}{10}$	$2\frac{5}{12}$ $\frac{3}{4}$	$5\frac{1}{2}$ $\frac{7}{12}$	$3\frac{7}{8}$ $2\frac{11}{16}$

7. Don sold $\frac{3}{4}$ dozen ears of corn Friday, $1\frac{1}{2}$ dozen ears on Saturday, and $2\frac{3}{4}$ dozen ears Monday.

Add $\frac{3}{4}$, $1\frac{1}{2}$, and $2\frac{3}{4}$ to find how many dozen ears of corn Don sold. Make all the fractions *fourths*, then add. Change $\frac{8}{4}$ to a whole number and add it to 3.

$$\begin{aligned} \tfrac{3}{4} &= \tfrac{3}{4} \\ 1\tfrac{1}{2} &= 1\tfrac{2}{4} \\ 2\tfrac{3}{4} &= 2\tfrac{3}{4} \\ \hline 3\tfrac{8}{4} &= 5 \end{aligned}$$

How many dozen ears of corn did Don sell?

Copy and add.

8.	$2\frac{5}{8}$ $3\frac{1}{2}$ $1\frac{3}{4}$	$5\frac{1}{6}$ $2\frac{1}{3}$ $2\frac{1}{2}$	$1\frac{3}{10}$ $3\frac{1}{2}$ $2\frac{7}{10}$	$4\frac{3}{4}$ $2\frac{1}{12}$ $3\frac{1}{2}$	$2\frac{1}{3}$ $\frac{8}{9}$ $1\frac{2}{3}$
9.	$\frac{5}{12}$ $1\frac{1}{2}$ $2\frac{1}{3}$	$3\frac{1}{3}$ $1\frac{5}{6}$ $1\frac{5}{12}$	$4\frac{1}{4}$ $2\frac{3}{16}$ $1\frac{7}{8}$	$2\frac{5}{6}$ $5\frac{1}{2}$ $8\frac{1}{3}$	$3\frac{1}{2}$ $4\frac{13}{16}$ $1\frac{5}{8}$

Subtracting With Mixed Numbers

$5\frac{1}{2} = 5\frac{2}{4}$
$3\frac{1}{4} = 3\frac{1}{4}$
$2\frac{1}{4}$

1. Bob sold two chickens. One weighed $5\frac{1}{2}$ pounds and the other weighed $3\frac{1}{4}$ lb. Subtract to find how much more the first chicken weighed than the second.

$$5\tfrac{1}{2} - 3\tfrac{1}{4} = ?$$

You can check subtraction of fractions just as you check subtraction of whole numbers. To check this example, add the answer ($2\frac{1}{4}$) to $3\frac{1}{4}$. The sum is $5\frac{2}{4}$. $5\frac{2}{4} = 5\frac{1}{2}$, the number you subtracted from.

Copy, subtract, and check.

	a	b	c	d	e
2.	$2\frac{3}{4}$ $1\frac{1}{2}$	$3\frac{1}{2}$ $2\frac{1}{8}$	$4\frac{1}{2}$ $2\frac{3}{8}$	$4\frac{5}{8}$ $1\frac{1}{4}$	$7\frac{3}{4}$ $3\frac{3}{8}$
3.	$8\frac{5}{6}$ $2\frac{1}{2}$	$5\frac{1}{2}$ $3\frac{1}{6}$	$4\frac{2}{3}$ $1\frac{1}{6}$	$7\frac{9}{10}$ $4\frac{1}{2}$	$8\frac{4}{5}$ $5\frac{3}{10}$
4.	$6\frac{3}{4}$ $2\frac{5}{12}$	$8\frac{1}{2}$ $3\frac{1}{12}$	$7\frac{11}{12}$ $2\frac{3}{4}$	$9\frac{1}{2}$ $5\frac{3}{16}$	$10\frac{15}{16}$ $5\frac{3}{4}$

Borrowing With Mixed Numbers

1. Sally bought $4\frac{1}{2}$ yards of material to make a dress. She found that she needed only $3\frac{7}{8}$ yards. To find what part of a yard she had left, subtract $3\frac{7}{8}$ from $4\frac{1}{2}$.

$$4\tfrac{1}{2} = 4\tfrac{4}{8} = 3\tfrac{12}{8}$$
$$3\tfrac{7}{8} = 3\tfrac{7}{8} = 3\tfrac{7}{8}$$
$$\overline{\qquad\qquad\quad \tfrac{5}{8}}$$

How much material did Sally have left?

Check your answer as in any other subtraction example. $3\frac{7}{8} + \frac{5}{8} = 3\frac{12}{8}$. Is $3\frac{12}{8}$ the same as $4\frac{1}{2}$?

Copy, subtract, and check.

	a	b	c	d	e
2.	$6\frac{1}{2}$ $2\frac{3}{4}$	$5\frac{1}{4}$ $3\frac{1}{2}$	$8\frac{1}{8}$ $4\frac{1}{2}$	$9\frac{3}{8}$ $2\frac{3}{4}$	$7\frac{1}{2}$ $6\frac{5}{6}$
3.	$2\frac{1}{2}$ $\frac{5}{8}$	$1\frac{1}{6}$ $\frac{1}{2}$	$9\frac{3}{10}$ $4\frac{1}{2}$	$8\frac{1}{5}$ $3\frac{7}{10}$	$3\frac{1}{2}$ $\frac{9}{10}$
4.	$6\frac{1}{9}$ $5\frac{2}{3}$	$7\frac{1}{3}$ $2\frac{7}{9}$	$9\frac{7}{12}$ $7\frac{1}{2}$	$8\frac{1}{12}$ $7\frac{3}{4}$	$9\frac{2}{5}$ $1\frac{9}{10}$
5.	$8\frac{1}{2}$ $2\frac{1}{12}$	$7\frac{1}{4}$ $4\frac{11}{16}$	$10\frac{3}{16}$ $7\frac{1}{2}$	$12\frac{5}{12}$ $8\frac{3}{4}$	$20\frac{5}{16}$ $13\frac{3}{4}$

Two-Step Quickies

Just write the answers to these quickies.

1. Peggy bought an ice cream cone costing 12 cents. She gave the clerk a dime and a nickel. How much change should she get?

2. Ann's spring vacation is 2 weeks long. It starts on April 4. On what date does it end?

3. Don pulled 30 beets in his garden. He gave his mother a dozen of them and wants to tie the rest in 3 equal bunches. How many beets should he put in each bunch?

4. Lemons are 2 for 9 cents. How much must Ellen pay for 8 lemons to make lemonade for her party?

5. Jill picked 48 roses. She put them in bunches with 8 roses in each bunch and sold them for 10 cents a bunch. How much did she get?

6. Mrs. Lane bought a dozen eggs. She used 3 eggs to make a cake and 4 eggs to make an omelet. How many eggs did she have left?

7. Jill's mother baked 24 rolls. She let the girls take one fourth of them for a supper on the lawn. How many rolls were left?

8. Sam's fish weighed 2 pounds. Bob's fish weighed 12 ounces. How many ounces heavier was Sam's fish than Bob's?

9. Bill's baseball team played 3 games. They made 7 runs in the first game, 4 runs in the second game, and 10 runs in the third game. How many runs did they make per game, on the average?

10. Sally bought 3 grapefruit costing 9 cents each and a loaf of bread costing 20 cents. How much did she spend?

Practice With Money Numbers

Copy, add, and check.

	a	b	c	d	e
1.	\$ .47 .06 .50 .87 .69	\$6.49 7.34 2.75 8.25 5.48	\$ 2.85 5.60 .99 12.36 4.05	\$50.16 73.98 32.67 9.75 14.74	\$ 97.38 98.63 239.70 86.66 410.05

Copy, subtract, and check.

2.	\$1.04 .38	\$14.81 5.39	\$24.00 6.08	\$69.62 42.97	\$64.00 23.25
3.	\$26.13 6.39	\$92.50 74.49	\$162.01 32.94	\$170.00 85.12	\$862.97 573.69

Copy, multiply, and check.

4.	\$ .94 37	\$4.60 25	\$3.07 49	\$6.75 83	\$8.25 1 60

Copy, divide, and check.

	a	b	c	d
5.	$57\overline{)\$5.13}$	$64\overline{)\$16.00}$	$83\overline{)\$89.64}$	$40\overline{)\$14.80}$
6.	$72\overline{)\$201.60}$	$94\overline{)\$130.66}$	$12\overline{)\$45.60}$	$33\overline{)\$95.50}$

Do what the signs tell you to do.

	a	b	c
7.	47 × \$2.68	\$10 − \$4.81	\$3.08 + 94¢
8.	\$7.50 ÷ 25	\$2 + \$4.67	\$9.12 − \$8.50
9.	\$8.28 ÷ 18	\$20.48 ÷ 32	\$31.50 + \$147
10.	\$1000 − \$767	25 × \$3.89	106 × \$7.06

Three Ways To Change Fractions

The examples on this page will help you remember three ways to change fractions.

Copy these fractions and change them to *higher terms* by writing the missing numerators.

	a	b	c	d
1.	$\frac{1}{2} = \frac{?}{8}$	$\frac{2}{3} = \frac{?}{6}$	$\frac{1}{2} = \frac{?}{10}$	$\frac{3}{5} = \frac{?}{10}$
2.	$\frac{2}{3} = \frac{?}{9}$	$\frac{2}{3} = \frac{?}{12}$	$\frac{1}{2} = \frac{?}{12}$	$\frac{3}{4} = \frac{?}{12}$
3.	$\frac{1}{2} = \frac{?}{16}$	$\frac{3}{4} = \frac{?}{16}$	$\frac{7}{8} = \frac{?}{16}$	$\frac{3}{10} = \frac{?}{20}$
4.	$\frac{3}{4} = \frac{?}{8}$	$\frac{4}{5} = \frac{?}{10}$	$\frac{5}{6} = \frac{?}{12}$	$\frac{5}{8} = \frac{?}{16}$
5.	$\frac{1}{2} = \frac{?}{32}$	$\frac{1}{2} = \frac{?}{36}$	$\frac{1}{4} = \frac{?}{36}$	$\frac{3}{4} = \frac{?}{36}$

Copy these fractions and change each to its *lowest terms.*

6.	$\frac{2}{4} = ?$	$\frac{2}{6} = ?$	$\frac{4}{6} = ?$	$\frac{3}{6} = ?$
7.	$\frac{4}{8} = ?$	$\frac{6}{8} = ?$	$\frac{5}{10} = ?$	$\frac{4}{10} = ?$
8.	$\frac{6}{10} = ?$	$\frac{6}{9} = ?$	$\frac{6}{12} = ?$	$\frac{4}{12} = ?$
9.	$\frac{9}{12} = ?$	$\frac{8}{16} = ?$	$\frac{6}{16} = ?$	$\frac{12}{16} = ?$
10.	$\frac{4}{20} = ?$	$\frac{10}{20} = ?$	$\frac{16}{32} = ?$	$\frac{27}{36} = ?$

11. Change $\frac{9}{6}$ to a *mixed number in lowest terms.*

$$\frac{9}{6} = 1\frac{3}{6} = ?$$

12. Change $\frac{12}{4}$ to a *whole number.* $\frac{12}{4} = ?$.

Copy these improper fractions and change each to a *whole number* or a *mixed number in lowest terms.*

13.	$\frac{6}{4} = ?$	$\frac{7}{4} = ?$	$\frac{6}{6} = ?$	$\frac{10}{8} = ?$
14.	$\frac{10}{6} = ?$	$\frac{8}{4} = ?$	$\frac{12}{8} = ?$	$\frac{9}{6} = ?$
15.	$\frac{20}{8} = ?$	$\frac{16}{12} = ?$	$\frac{20}{16} = ?$	$\frac{24}{16} = ?$

Which Is Larger?

1. Which is heavier, $\frac{1}{4}$ lb. or 3 oz.?
2. Which is longer, $\frac{1}{2}$ ft. or 8 in.?
3. Which is longer, $\frac{1}{4}$ hr. or 20 min.?
4. Which is more, $\frac{1}{4}$ bu. or 7 qt.?
5. Which is longer, $\frac{1}{3}$ yr. or 3 mo.?
6. Which is larger, $\frac{1}{2}$ gal. or 3 qt.?
7. Which is longer, $\frac{1}{4}$ yd. or 10 in.?
8. Which is more, $\frac{1}{6}$ doz. or $\frac{1}{3}$ doz.?
9. Which is more, $\frac{3}{4}$ doz. or $\frac{1}{2}$ doz.?
10. Which is heavier, $\frac{1}{2}$ lb. or $\frac{3}{8}$ lb.?
11. Which is longer, $\frac{3}{4}$ yd. or $\frac{1}{2}$ yd.?
12. Which is longer, $\frac{7}{8}$ in. or $\frac{3}{4}$ in.? (If you are not sure, you had better change $\frac{3}{4}$ to eighths.)
13. Which is longer, $\frac{7}{8}$ in. or $\frac{9}{16}$ in.?
14. Which is longer, $\frac{5}{6}$ ft. or $\frac{11}{12}$ ft.?
15. Which is more, $\frac{1}{2}$ bu. or $\frac{5}{8}$ bu.?
16. Which is farther, $\frac{3}{8}$ mi. or $\frac{1}{2}$ mi.?
17. Which is heavier, $\frac{1}{2}$ ton or $\frac{3}{10}$ ton?
18. Which fraction is larger, $\frac{1}{4}$ or $\frac{1}{6}$? $\frac{1}{5}$ or $\frac{1}{3}$?
19. Suppose you are comparing two fractions, both with the *numerator 1*. Is the fraction with the *larger denominator* the *larger* or *smaller* of the two fractions?
20. Which fraction is larger, $\frac{3}{8}$ or $\frac{7}{8}$? $\frac{7}{12}$ or $\frac{5}{12}$?
21. Suppose you are comparing two fractions with the *same denominator*. Is the fraction with the *larger numerator* the *larger* or *smaller* of the two fractions?

Pages 298 and 299 provide enrichment material which can be used after this page.

Quickies With Fractions

See if you can work these quickies without using your pencil except to write the answers.

1. Mrs. Lane bought $\frac{1}{2}$ pound of pork and $1\frac{1}{4}$ pounds of beef to make a meat loaf. How many pounds of meat did she buy?

2. Mrs. Lane cut the meat loaf into 8 equal pieces and served 5 pieces. What fraction of the meat loaf did she serve?

3. Ben lives 4 miles from school. Andy lives $3\frac{3}{10}$ miles from school. How much farther from school does Ben live than Andy?

4. Sue wants to make a pudding. The recipe calls for 2 cups of milk. Sue has only $\frac{3}{4}$ cup of milk. How much more milk does she need?

5. Sam caught two trout. One weighed $1\frac{1}{8}$ lb. The other weighed $1\frac{1}{4}$ lb. Find the total weight of the two fish.

6. How many inches longer is a fish 14 inches long than a fish which is $12\frac{1}{2}$ inches long?

7. Don worked $1\frac{1}{2}$ hr. weeding his garden and $\frac{3}{4}$ hr. cutting the grass. How many hours did he work in all?

8. It is $\frac{3}{10}$ of a mile from Jean's house to the store and $\frac{1}{2}$ mile farther from the store to the church. How far is it from Jean's house to the church?

9. Nancy wants to practice her music 1 hour today. She practiced $\frac{1}{4}$ hour this morning and $\frac{1}{2}$ hour this afternoon. What fraction of an hour must she still practice?

10. Bill and Tom cut a neighbor's lawn together. Bill worked $1\frac{1}{2}$ hours and Tom worked $2\frac{1}{4}$ hours. How much longer than Bill did Tom work?

Can You Find the Missing Figures?

One figure has been left out in each of these examples. Copy the examples and fill in the missing figures.

	a	b	c
1.	$1 = \frac{?}{8}$	$1\frac{1}{8} = \frac{?}{8}$	$1\frac{3}{4} = \frac{?}{4}$
2.	$3\frac{1}{6} = 2\frac{?}{6}$	$5\frac{2}{3} = 4\frac{?}{3}$	$7\frac{3}{8} = 6\frac{?}{8}$
3.	$\frac{1}{2} = \frac{?}{4}$	$\frac{3}{4} = \frac{?}{12}$	$\frac{5}{8} = \frac{?}{16}$
4.	$\frac{8}{12} = \frac{?}{3}$	$\frac{14}{16} = \frac{?}{8}$	$\frac{30}{36} = \frac{?}{6}$
5.	$\frac{10}{8} = 1\frac{?}{4}$	$\frac{16}{6} = 2\frac{?}{3}$	$\frac{16}{10} = 1\frac{?}{5}$
6.	$\frac{3}{8} + \frac{3}{8} = \frac{?}{4}$	$\frac{1}{2} + \frac{1}{4} = \frac{?}{4}$	$\frac{3}{10} + \frac{2}{5} = \frac{?}{10}$
7.	$1 - \frac{5}{8} = \frac{?}{8}$	$\frac{3}{4} - \frac{5}{12} = \frac{?}{3}$	$\frac{13}{16} - \frac{1}{4} = \frac{?}{16}$

Practice With Fractions

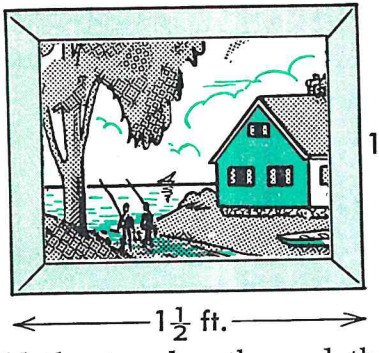
Copy and add.

	a	b	c	d	e	f
1.	$3\frac{3}{8}$ $2\frac{1}{8}$	$2\frac{3}{10}$ $4\frac{7}{10}$	$5\frac{5}{8}$ $1\frac{7}{8}$	$4\frac{1}{16}$ $3\frac{1}{2}$	$2\frac{1}{4}$ $6\frac{5}{8}$	$3\frac{3}{4}$ $5\frac{7}{12}$
2.	$7\frac{6}{10}$ $3\frac{1}{2}$	$4\frac{3}{4}$ $5\frac{7}{12}$	$1\frac{4}{5}$ $4\frac{3}{10}$	$7\frac{1}{2}$ $2\frac{5}{12}$	$3\frac{7}{8}$ $3\frac{9}{16}$	$5\frac{11}{12}$ $5\frac{5}{6}$

Copy, subtract, and check.

3.	$3\frac{7}{8}$ $2\frac{3}{8}$	2 $\frac{5}{6}$	$5\frac{1}{4}$ $1\frac{3}{4}$	$4\frac{3}{4}$ $2\frac{1}{2}$	$6\frac{5}{6}$ $4\frac{1}{3}$	$9\frac{5}{8}$ $2\frac{1}{4}$
4.	$7\frac{11}{12}$ $3\frac{2}{3}$	$8\frac{1}{6}$ $5\frac{1}{2}$	$6\frac{3}{4}$ 2	$9\frac{1}{8}$ $4\frac{3}{4}$	$8\frac{1}{2}$ $7\frac{9}{10}$	$9\frac{1}{4}$ $7\frac{5}{12}$
5.	$7\frac{3}{10}$ $5\frac{4}{5}$	$9\frac{7}{10}$ $8\frac{2}{5}$	$10\frac{3}{4}$ $3\frac{3}{16}$	$8\frac{1}{2}$ $7\frac{11}{12}$	$10\frac{9}{16}$ $4\frac{3}{4}$	$13\frac{9}{10}$ $6\frac{3}{5}$

Finding the Perimeter of Rectangles



1. Jean likes to paint pictures. Her father made a frame for one of Jean's pictures. The frame was to be $1\frac{1}{2}$ ft. long and $1\frac{1}{4}$ ft. wide on the outside.

To find the length of the piece of wood needed to make the frame, add the two lengths and the two widths, and then add the two sums. The picture frame is a rectangle.

The two lengths are $1\frac{1}{2}$ ft. + $1\frac{1}{2}$ ft. = ? ft.

The two widths are $1\frac{1}{4}$ ft. + $1\frac{1}{4}$ ft. = ? ft.

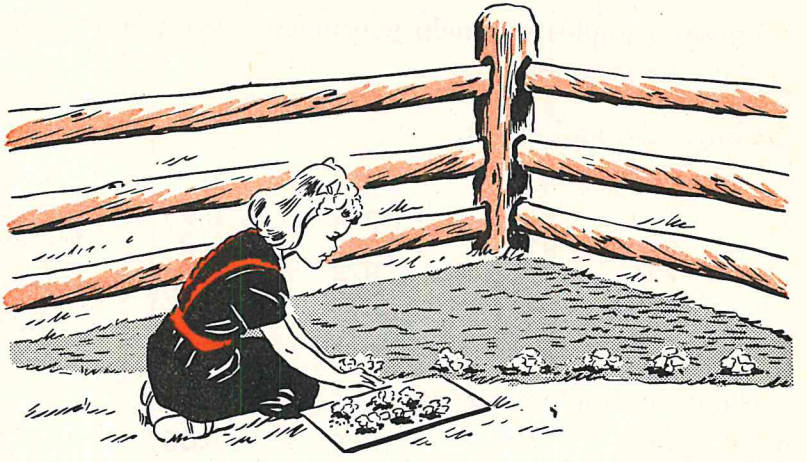
Add the two sums. How many feet of wood will it take to make the frame?

The distance around a rectangle is called its **perimeter.**

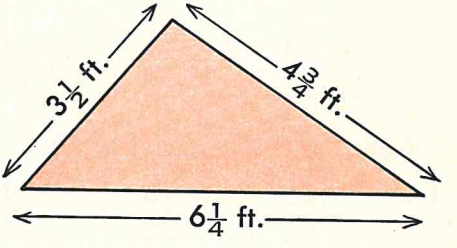
2. Sam wants to put a wire fence around his rabbit yard. The yard is a rectangle $8\frac{1}{2}$ ft. long and $6\frac{3}{4}$ ft. wide.

Draw a picture of the rabbit yard. On it, write the length and the width. Find how many feet of fence Sam needs for his rabbit yard.

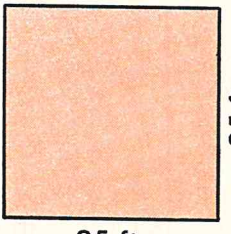
Finding Other Perimeters



1. The diagram at the right shows one of Jill's flower beds. It has three straight sides. It is a **triangle.** To find the perimeter of the triangle, add the lengths of the three sides. How far is it around the flower bed?



Jill is planting pansies around the flower bed. If she puts in 2 plants for each foot, how many plants will she need? (Count 1 plant for the ½ foot.)



2. At the left is a sketch of Bob's chicken yard. His yard is a **square.** All four sides are equal. Each side is 25 ft. long.

You can find the perimeter of this square by adding 25 ft., 25 ft., 25 ft., and 25 ft. Can you find it in a shorter way? What is the perimeter of Bob's chicken yard?

Keeping in Practice

These examples will help you make sure of your skills in the four processes.

Copy, add, and check.

	a	b	c	d	e
1.	349 971 775 180 878	5577 8169 4765 8206 6490	944 2648 873 99 7156	\$ 8.95 66.25 4.00 .69 57.25	\$ 87.49 544.89 21.96 735.20 63.33

Copy, subtract, and check.

2.	117 68	702 295	1009 235	8403 4608	12571 4769
3.	\$2.70 .95	\$12.94 3.59	\$40.25 36.90	\$161.63 87.57	\$100.00 31.78

Copy, multiply, and check.

4.	56 27	95 34	\$ .80 25	209 98	370 46
5.	\$1.29 16	\$6.75 39	486 150	708 307	735 918

Copy, divide, and check.

6. $23\overline{)897}$ $45\overline{)3780}$ $36\overline{)972}$ $55\overline{)8030}$ $92\overline{)26220}$

7. $61\overline{)4300}$ $14\overline{)5404}$ $79\overline{)40271}$ $27\overline{)\$67.50}$ $40\overline{)\$27.60}$

Do what the signs tell you to do.

	a	b	c
8.	\$17.76 + \$3.26	68 × 486	\$114 ÷ 30
9.	\$15 − \$7.89	1788 ÷ 12	93 × \$6.48

Making Up Measure Problems

See if you can make up problems about measures. Write a problem about each of the situations on this page. Work your problems yourself, then exchange them with one of your classmates. Can you work his problems? Can he work your problems?

1. Make up a problem about how many minutes you worked on two different days and how many hours you worked in all.

2. Make up a problem about how long a puppet show lasted, if it started at half past two.

3. Make up a problem about how many quarts of ice cream you must buy for a party, if a pint of ice cream serves three people.

4. Make up a problem about how many inches will be left if you saw off a piece from a board 3 feet long.

5. Make up a problem about making several pounds of candy and putting the candy into boxes holding 8 ounces each.

6. Make up a problem about how many degrees colder it is outdoors than indoors.

7. Make up a problem about how many arm bands, each 9 inches long, you can cut from a piece of ribbon a certain number of yards long.

8. Make up a problem about meeting your father on a train that was 15 minutes late.

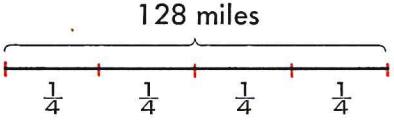
9. Make up a problem about the total weight of two parcel post packages in pounds and ounces.

10. Make up a problem about how many inches you have grown in the last year.

Using Pictures To Solve Problems

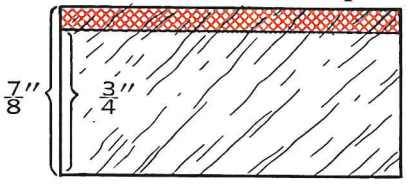
Sometimes using a picture or drawing will help you understand what to do to solve a problem.

1. The Lanes started on a 128-mile drive. Mr. Lane said they would eat lunch when they had gone $\frac{3}{4}$ of the way.



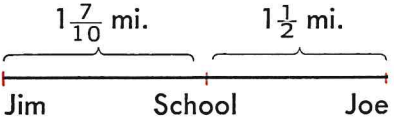
Jean drew this picture to help her find $\frac{3}{4}$ of 128 miles. First she divided 128 by 4, to find $\frac{1}{4}$ of 128. Then she multiplied by 3 to find 3 fourths.

How many miles are $\frac{3}{4}$ of 128 miles?



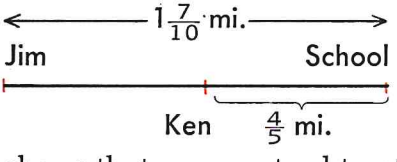
2. Dick has a board $\frac{7}{8}$" ($\frac{7}{8}$ of an inch) thick. He wants to know how much he must cut off with his plane so that the board will be $\frac{3}{4}$" thick. His picture shows him that he must subtract $\frac{3}{4}$ from $\frac{7}{8}$.

What fraction of an inch must Dick plane off?



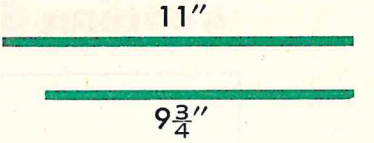
3. Jim lives $1\frac{7}{10}$ miles west of the school. Joe lives $1\frac{1}{2}$ miles east of the school. The picture shows that you must add $1\frac{7}{10}$ mi. and $1\frac{1}{2}$ mi. to find how far apart the boys live.

How many miles is Jim's house from Joe's house?



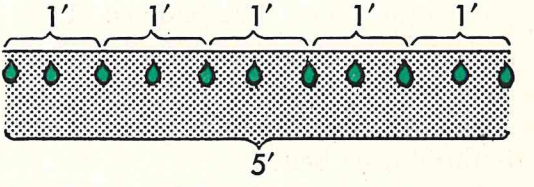
4. Jim lives $1\frac{7}{10}$ miles from school. Ken lives on the same road as Jim, only $\frac{4}{5}$ mile from the school. The picture shows that you must subtract $\frac{4}{5}$ mile from $1\frac{7}{10}$ miles to find how far Ken lives from Jim. How far is it?

5. At noon one day in March, Tom measured the length of the shadow of a stick 1 foot high. It was 11 inches. At noon several days later, the shadow was only $9\frac{3}{4}$″ long. Tom kept a record of his measurements by drawing lines to show each length. The lines show that to find how much shorter the second shadow was, Tom must subtract $9\frac{3}{4}$″ from 11″.



How much shorter was the second shadow?

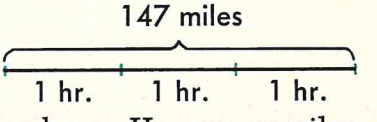
6. Jill is going to plant some flower bulbs 6″ apart. She wants to know how many bulbs she can plant in a row 5′ (5 feet) long. She drew this picture to help her find out.



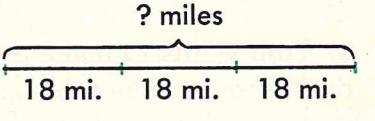
How many bulbs can she plant in a 5-foot row, with a bulb at each end of the row?

7. Show how many blueberry bushes Don can plant 4 feet apart in a 32-foot row, with a bush at each end of the row. How many bushes can he plant?

8. The train on which Sue was riding went 147 miles in 3 hours. Sue drew this picture to help her find the average rate per hour. How many miles did the train average?

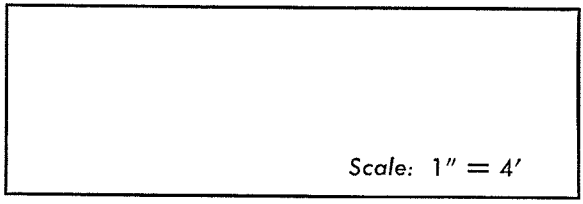


9. Our car goes 18 miles on a gallon of gasoline. The picture shows how to find how far we can go on 3 gallons of gasoline.



How many miles will 3 gallons take us?

Reading Scale Drawings

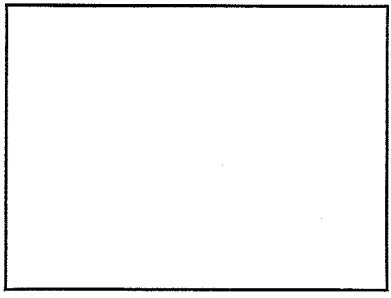


1. Jill made this drawing to show the flower bed in which she had planted asters. It is a scale drawing. Each inch stands for 4 feet. The scale is: $1'' = 4'$.

The drawing is 1 inch wide. That means the flower bed is really 1×4, or 4 feet wide.

Measure the length of the drawing. How many feet long is the flower bed?

The perimeter of the flower bed is how many feet?



2. Tom made this scale drawing of the dining room in his house. The scale of the drawing is $1'' = 8'$. Each inch stands for 8 feet.

How many inches long is the drawing? Then how many feet long is the dining room?

The drawing is $1\frac{1}{2}''$ wide. To find the width of the dining room, multiply 8 by $1\frac{1}{2}$. $1 \times 8 = 8$, and $\frac{1}{2}$ of $8 = 4$. So $1\frac{1}{2} \times 8 = 8 + 4$, or ? feet.

3. Tom wants to make a scale drawing of the table in the dining room. The table is 6 ft. long. How long should the drawing of the table be if $1'' = 8'$? $\frac{6}{8}'' =$? in. The table is 4 ft. wide. How wide should the drawing be? $\frac{4}{8}'' =$? in.

4. Linda's father is going to build a new house. Linda saw a scale drawing of the house. The scale was $1'' = 4'$.

a. On the drawing, a closet door was $\frac{1}{2}$ in. wide. How many feet wide will the door be? $\frac{1}{2}$ of $4 = ?$

b. A window was $\frac{3}{4}$ in. wide. How many feet wide was it? $\frac{3}{4}$ of $4 = ?$

c. Linda's bedroom is $3\frac{1}{2}$ in. wide. How many feet wide will it be? $3\frac{1}{2} \times 4 = 12 + 2 = ?$

d. Her bedroom is $4\frac{1}{4}$ in. long. How many feet is this? $4\frac{1}{4} \times 4 = 16 + 1 = ?$

5. On a scale drawing where $1'' = 8'$:

a. A line $\frac{3}{4}$ in. long stands for $\frac{3}{4}$ of 8 ft., or ? ft.

b. $1\frac{3}{4}$ in. stands for $1\frac{3}{4} \times 8 = 8 + 6 =$? ft.

c. $2\frac{1}{2}$ in. stands for $2\frac{1}{2} \times 8 = 16 + 4 =$? ft.

d. $3\frac{1}{4}$ in. stands for $3\frac{1}{4} \times 8$ or ? ft.

6. On a scale drawing where $1'' = 12'$:

a. A line $\frac{1}{2}$ in. long stands for $\frac{1}{2}$ of 12, or ? ft.

b. A line $\frac{3}{4}$ in. long stands for ? ft.

c. $1\frac{1}{2}$ in. stands for $1\frac{1}{2} \times 12 = 12 + 6 =$? ft.

d. $1\frac{3}{4}$ in. stands for $1\frac{3}{4} \times 12 = 12 + 9 =$? ft.

e. $2\frac{1}{2}$ in. stands for $2\frac{1}{2} \times 12 =$? ft.

7. These lines are drawn to a scale of $1'' = 8'$. Measure each line and write on your paper the number of feet it stands for.

a.

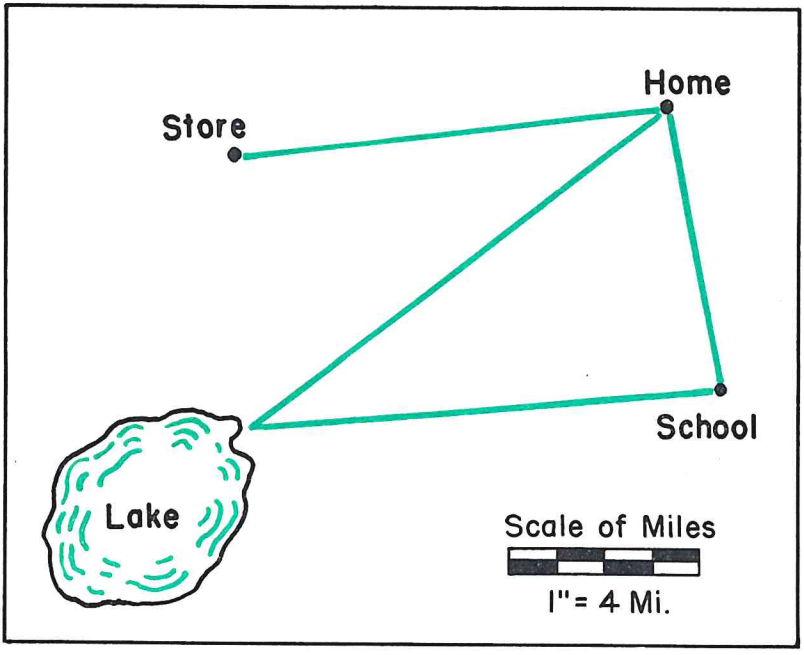
b.

c.

d.

8. If you made a scale drawing of a room 18 ft. long and let $1'' = 4'$, how many inches long would your drawing be? $18 \div 4 = ?$

Using Scale Maps



1. Sam lives in the country. He drew this scale map to show his cousin how far he lives from the store, the school, and the lake where he goes fishing. The scale is 1 inch to 4 miles.

On Sam's map, the line from his home to the school is $1\frac{1}{2}$ in. Since 1 inch = 4 miles, the distance from Sam's house to the school is $1\frac{1}{2} \times 4$, or ? miles.

2. Measure the line from Sam's house to the store. To the nearest quarter of an inch, it is $2\frac{1}{4}$ in. long. How many miles does $2\frac{1}{4}$ in. equal?

3. How many inches long is the line from Sam's home to the lake? How many miles does this equal?

4. On this map, how many miles would $3\frac{3}{4}$ inches be?

5. Suppose you were drawing a map with a scale of 1″ = 2 miles. How many inches long would you make a line to show a distance of 4 miles? Of 6 miles? Of 3 miles? Of 7 miles?

6. If your scale was 1″ = 4 miles, how many inches would show a distance of 8 miles? Of 6 miles? Of 10 miles? Of 5 miles? Of 7 miles?

7. Jean Lane was looking at a road map showing some of the states the Lanes would drive through on their next trip. The map scale was 1″ = 15 miles. On the map, Ohio was about 16 inches wide. About how many miles wide is Ohio?

Up and down on the map, the greatest length of Ohio was about 14 inches. How many miles is this?

8. On the same map, Jean measured Indiana. It was about 10″ across, and about 18″ up and down. Jean estimated that Indiana was about ? miles wide and ? miles long in its longest part.

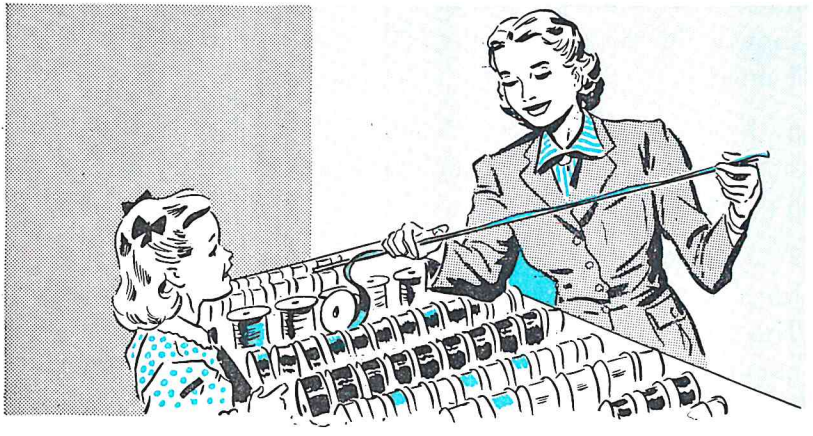
9. On another road map, 1 inch equaled 180 miles. The Lanes were planning to drive through two cities shown on this map. On the map, the cities were 9 inches apart. About how many miles is it from one of these cities to the other?

10. Dave's class was studying travel in the United States. On a classroom wall map of the United States, the scale was 1″ = 90 miles. The distance between Chicago and Los Angeles was about 20 inches. About how many miles apart are these two cities?

11. Tom is making a big scale map of the school grounds. The school stands on a piece of land that is 650 feet wide and 940 feet long. If Tom uses a scale of 1″ = 20′, how wide will his map be? How long will it be?

Pages 300 and 301 provide enrichment material which can be used after this page.

Multiplying With Mixed Numbers



\$ .40
$2\frac{3}{4}$
30
80
\$1.10

1. Sally bought $2\frac{3}{4}$ yards of ribbon costing 40 cents a yard. To find how much she had to pay for it, multiply \$.40 by $2\frac{3}{4}$.

First, you multiply 40 by $\frac{3}{4}$. When you multiply 40 by $\frac{3}{4}$, you are really finding $\frac{3}{4}$ of 40. Since $\frac{1}{4}$ of 40 = 10, $\frac{3}{4}$ of 40 = 30.

Then you multiply 40 by 2. Notice that the product (80) is written exactly under the 30, because you are multiplying by 2 ones.

Now you add the two partial products, and write the dollar sign and the point in the product.

How much did Sally have to pay for $2\frac{3}{4}$ yards of ribbon?

2. The Lanes are planning a vacation trip. Jean is measuring on a map the distances to several places. The scale of the map is 1 inch to 40 miles.

On the map, it is $4\frac{1}{2}$ inches from their home to the mountains. Find how many *miles* this is by multiplying 40 by $4\frac{1}{2}$. How many miles is it?

3. Multiply 36 by $\frac{1}{2}$. $\frac{1}{2} \times 36$ is another way to say $\frac{1}{2}$ of 36. $\frac{1}{2} \times 36 = ?$

4. Multiply 30 by $\frac{2}{3}$. $\frac{1}{3} \times 30 = 10$, so $\frac{2}{3} \times 30 = ?$

5. Multiply 48 by $\frac{3}{4}$. $\frac{1}{4} \times 48 = 12$, so $\frac{3}{4} \times 48 = ?$

6. Multiply 54 by $\frac{5}{6}$. $\frac{1}{6} \times 54 = 9$, so $\frac{5}{6} \times 54 = ?$

7. Multiply 75 by $\frac{2}{5}$. $\frac{1}{5} \times 75 = 15$, so $\frac{2}{5} \times 75 = ?$

8. Multiply 64 by $\frac{7}{8}$. $\frac{1}{8} \times 64 = 8$, so $\frac{7}{8} \times 64 = ?$

How well can you multiply by fractions? Copy these examples and find the products.

	a	*b*	*c*	*d*
9.	$\frac{1}{2} \times 32 = ?$	$\frac{1}{4} \times 28 = ?$	$\frac{1}{3} \times 36 = ?$	$\frac{1}{6} \times 24 = ?$
10.	$\frac{1}{8} \times 40 = ?$	$\frac{1}{5} \times 35 = ?$	$\frac{2}{3} \times 15 = ?$	$\frac{3}{4} \times 20 = ?$
11.	$\frac{5}{8} \times 80 = ?$	$\frac{5}{6} \times 18 = ?$	$\frac{3}{5} \times 20 = ?$	$\frac{7}{8} \times 24 = ?$
12.	$\frac{3}{4} \times 60 = ?$	$\frac{2}{3} \times 60 = ?$	$\frac{5}{6} \times 36 = ?$	$\frac{4}{5} \times 60 = ?$

How well can you multiply by mixed numbers? Copy the following examples and find the products.

	a	*b*	*c*	*d*	*e*
13.	$16 \times 2\frac{1}{2}$	$20 \times 3\frac{1}{4}$	$15 \times 1\frac{1}{3}$	$24 \times 2\frac{1}{8}$	$20 \times 3\frac{1}{5}$
14.	$12 \times 1\frac{3}{4}$	$12 \times 2\frac{2}{3}$	$16 \times 4\frac{3}{8}$	$36 \times 2\frac{2}{3}$	$24 \times 3\frac{3}{4}$
15.	$32 \times 1\frac{1}{2}$	$60 \times 1\frac{5}{6}$	$10 \times 2\frac{2}{5}$	$30 \times 4\frac{3}{5}$	$36 \times 3\frac{3}{4}$
16.	$48 \times 6\frac{3}{4}$	$72 \times 3\frac{1}{8}$	$63 \times 3\frac{2}{3}$	$80 \times 4\frac{3}{4}$	$72 \times 3\frac{1}{2}$
17.	$\$ .48 \times 1\frac{1}{2}$	$\$ .60 \times 2\frac{1}{4}$	$\$ .50 \times 3\frac{1}{2}$	$\$ .32 \times 2\frac{3}{4}$	$\$ .80 \times 2\frac{3}{8}$

Using Mixed Numbers

In most of these problems, you multiply by mixed numbers. When your answer is a money number, remember to put in the dollar sign and the point. Where does the point always go?

1. To make a meat loaf, Mrs. Lane bought $2\frac{3}{4}$ pounds of chopped meat at 64 cents a pound. How much did she pay?

2. Bob sold a chicken weighing $4\frac{1}{2}$ pounds for 42 cents a pound. How much did he get for the chicken?

3. For the holidays, Mrs. Lane bought a turkey weighing $13\frac{1}{2}$ pounds and a ham weighing $6\frac{3}{4}$ pounds. How many pounds of meat did she buy?

4. It took Tom $1\frac{3}{4}$ hours to cut the grass. His father paid him 40 cents an hour. How much did Tom earn?

5. Don wants to work 5 hours for his father to earn money toward buying a cultivator for his garden. He has already worked $3\frac{1}{3}$ hours. How much longer must he work?

6. Jean has a scale map, on which 1 inch = 40 miles. On the map, it is $6\frac{1}{4}$ inches from her home to the seashore. How many miles is this?

7. On the map in Problem 6, it is $2\frac{3}{4}$ inches from Jean's home to a lake resort. How many miles is it to the lake resort?

8. At the store, Sally bought a piece of cheese weighing $2\frac{1}{2}$ pounds. At 72 cents a pound, how much did Sally pay for the cheese?

9. It is $7\frac{3}{10}$ miles on the school bus from Jane's house to the school. It is $5\frac{1}{2}$ miles from Jill's home to the school. How much farther from the school does Jane live than Jill?

10. If we average 36 miles an hour on a trip, how many miles should we go in $2\frac{1}{4}$ hours?

11. Sally's mother bought $3\frac{1}{4}$ yards of cloth to make Sally a dress. She paid \$1.20 a yard for it. How much did the cloth for the dress cost?

12. The largest fish Sam caught last year was $12\frac{1}{2}$ inches long. This year he has caught a fish $13\frac{3}{8}$ inches long. How much longer is this fish than last year's longest fish?

13. The week before the recital, Nancy practiced her piano $1\frac{1}{3}$ hours a day for 6 days. How many hours did she practice that week?

14. Bob picked $4\frac{3}{4}$ bushels of apples from one tree and $5\frac{1}{2}$ bushels from another tree. How many bushels of apples did he pick from the two trees?

15. Sally worked $2\frac{2}{3}$ hours on Saturday taking care of a neighbor's little girl. If she got 30 cents an hour, how much did she earn?

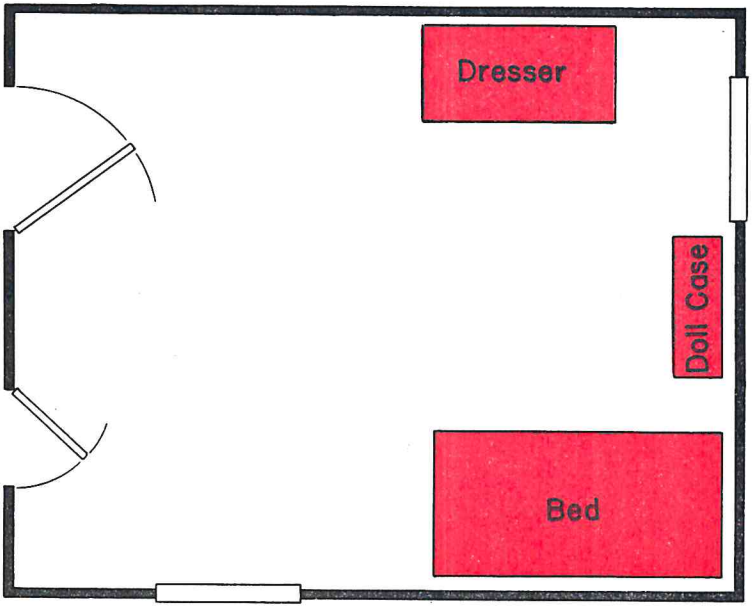
16. Dick wants to make a picture frame $13\frac{1}{2}$ inches long and $8\frac{3}{4}$ inches wide. How long a piece of wood does he need for the frame? (A drawing may help you solve this problem.)

17. If an airplane flies at an average speed of 224 miles an hour, how many miles will it fly in $4\frac{3}{4}$ hours?

18. Bill keeps a record of the time he works for his father. Last week he worked $9\frac{1}{4}$ hours. This week he has worked $7\frac{3}{4}$ hours. How many more hours did he work last week than this week?

19. Dick was making a shelf a yard long and 6″ wide. His mother asked him to make it $1\frac{1}{2}$ times as long and $1\frac{1}{2}$ times as wide. How many inches long should Dick make the shelf? How many inches wide?

Ann's Room



When Ann's father built a new house, Ann had a room of her own. Above is a scale drawing of her room.

1. The scale of the drawing is $1'' = 4'$. Measure the length and width of the room inside. How many feet long is it? How many feet wide?

2. There are two doors. The smaller one is the door to the clothes closet. Find how many feet wide the closet door is. How many feet wide is the other door?

3. The drawing shows where Ann is going to put her bed. The bed is drawn to the same scale as the room. How many feet long is the bed? How many feet wide?

4. Ann's father is building a case for Ann's collection of dolls between her bed and the window. How wide will the doll case be? How long?

Ann's father told her he had budgeted (set aside) $400 to buy furniture for her room. Ann helped pick out the furniture she wanted.

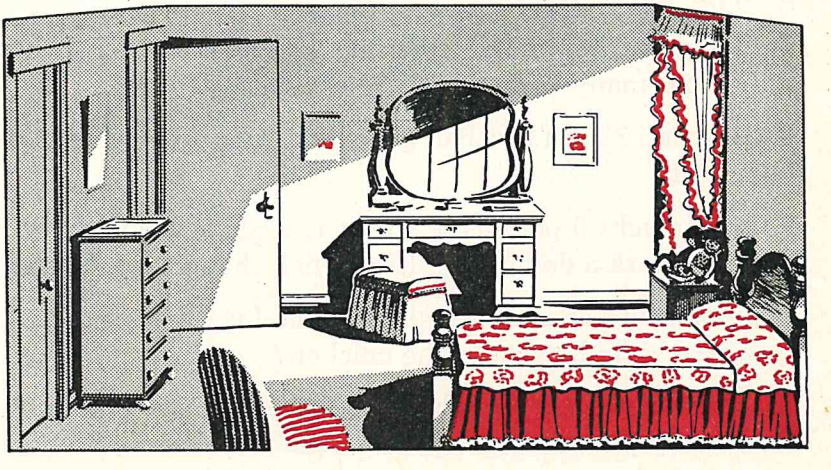
5. A bed that Ann liked cost $45. A good mattress for this bed cost $54.50 and box springs to go under the mattress cost $49.95. What was the total cost for Ann's bed?

6. Ann liked two dressers. The one that she liked best cost $92.50. The other dresser cost only $79.85. How much more expensive was the first dresser?

7. Ann and her father finally decided to buy the dresser that cost $92.50. The bench which went with it cost $14.60. What was the total cost of the dresser and the bench?

8. A 5-drawer chest cost $70.35. A 4-drawer chest cost $58.89. How much cheaper was the 4-drawer chest?

9. By this time, they had spent $45 for the bed, $104.45 for mattress and springs, $92.50 for the dresser, $14.60 for the bench, and $58.89 for the chest of drawers. How much had they spent in all? How much was left of the $400 Ann's father had planned to spend for Ann's furniture?



Completing Problems

Some of the numbers have been left out of these problems. Complete the problems by supplying the missing numbers. Then find the answers. On your paper, write the numbers you have filled in, and your answers.

1. How far will we drive in seven hours if we drive ? miles an hour on an average?

2. How many candy bars costing ? cents each can Jim buy for a quarter? Will he have any money left?

3. From a board 60 in. long, Dick cut off a piece ? in. long. How long was the piece that was left?

4. If oil costs ? cents a quart, how much will a gallon of oil cost at the same rate?

5. Sue made 3 pans of fudge for the candy sale. There were ? pieces of fudge in each pan. How many pieces of fudge did she make?

6. An airplane flew ? mi. in four hours. How many miles an hour did it average?

7. Sally was $55\frac{1}{2}$ in. tall last year. This year she is ? inches tall. How many inches has she grown in a year?

8. Bill paid ? for a baseball glove and ? for a bat. Find the total cost.

9. Sue bought 5 pounds of sugar at ? cents a pound. She gave the clerk a dollar bill. How much change did she get?

10. Bob sold a chicken weighing $3\frac{1}{2}$ lb. for ? cents a pound. How much did he get for the chicken?

11. Joan weighs ? pounds. Her father weighs ? pounds. How many pounds heavier than Joan is he?

Problems With Three Steps

Each of these problems has three steps. For each step you must answer a question. On your paper, write the three answers for each problem.

1. One Saturday, Tom's family went to the movies. Tom's father bought 2 tickets at 60 cents each and 3 children's tickets at 35 cents each. Find the total cost of the tickets.

a. How much did the 2 tickets cost?
b. How much were the children's tickets?
c. How much did all the tickets cost?

2. Sally bought 5 pounds of sugar for 9 cents a pound, and crackers for 18 cents. She gave the clerk a dollar bill. How much change did the clerk give her?

a. How much did she pay for the sugar?
b. How much were the sugar and crackers?
c. How much change did she get?

3. We are taking a 740-mile trip. The first day we drove 189 miles. The second day we drove 306 miles. Find how many hours it will take us to drive the rest of the way, if we average 35 miles an hour.

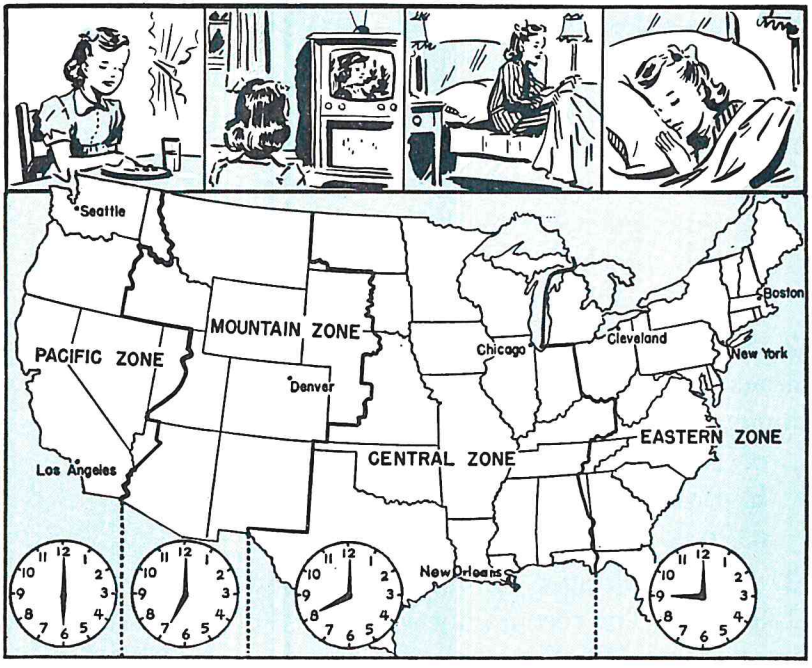
a. How many miles did we drive on the first two days?
b. How many more miles must we drive?
c. How many hours will this take?

4. There will be 27 people at our picnic. We want to have 2 sandwiches for each person. We have made 26 ham sandwiches and 19 peanut butter sandwiches. Find how many more sandwiches we must make.

a. How many sandwiches do we want?
b. How many sandwiches have we made?
c. How many must we still make?

Pages 302 and 303 provide enrichment material which can be used after this page.

How Time Changes



Kathie lives in Denver. At 7 o'clock one evening, she was listening to a television show. The broadcast was coming from New York. Kathie was surprised to hear the announcer say, "It is just 9 o'clock."

The map of the United States at the top of this page will help you understand how the time differs in the four time zones of our country.

While Kathie was looking at television at 7 o'clock in the Mountain Zone, children in the Pacific Zone were just eating dinner at 6 o'clock. Children in the Central Zone were getting ready to go to bed at 8 o'clock. Children in the Eastern Zone were already asleep at 9 o'clock.

Use the map and the clocks on page 224 to help you solve these problems about how time changes in the United States.

1. Kathie's cousin, Martin, lives in New York. At what time would Martin hear a television broadcast that Kathie was listening to in Denver at 5:15 p.m.?

2. Martin, in New York, gets up every morning at 7 o'clock. What time is it then in Kathie's house in Denver?

3. If a World's Series baseball game was broadcast from Chicago at 1:00 p.m., at what time would Martin hear it in New York? When would Kathie hear it in Denver? When would Kathie's uncle in Seattle hear it?

4. At what time would a boy in Los Angeles hear a radio program that was broadcast from New York at 6 p.m., Eastern time? When would Kathie hear it in Denver?

5. Name a city where the children might just be getting up at the time Kathie is eating breakfast in Denver at 8 o'clock.

6. Bill's father was in Los Angeles on a business trip. He wanted to telephone to his family in the state of Ohio so they would get the call at 9 p.m. At what time should he telephone from Los Angeles?

7. On a trip in their car, the Lanes crossed the line from the Central Zone into the Mountain Zone at 3 p.m. Tony wanted to change his watch from Central time to Mountain time. What time was it then by Mountain time?

8. When the Lanes drove back from the Mountain Zone into the Central Zone, should Tony set his watch forward or back? How many hours?

9. When a football game starts at 2 p.m. in Seattle, what time is it in New York?

Problems With Several Steps

How well can you work problems with more than one step? Some of these are two-step; some are three-step.

1. Nora bought 2 books for \$1.75 each and three 25-cent magazines. How much did she spend in all?

2. To make costumes for a school play, a committee bought $15\frac{1}{2}$ yd. of white cloth and $9\frac{1}{2}$ yd. of yellow cloth. The cloth cost 39 cents a yard. How much did the committee pay for all the cloth?

3. Bob sold 3 dozen eggs at $58\cent$ a dozen and a $5\frac{1}{2}$-pound chicken for 44 cents a pound. How much more did he get for the chicken than for the eggs?

4. Ann wants to buy a sweater that costs \$2.48. She had \$2, but she spent 25 cents of this for a colored handkerchief. How much more money does she need to buy the sweater?

5. Sally went to the store and bought $\frac{3}{4}$ lb. of meat at $80\cent$ a pound, and a loaf of bread for 18 cents. How much change should she get from a dollar?

6. Bill's baseball team won two games by scores of 8 to 3 and 16 to 9. How many more runs in all did Bill's team score than the other teams did?

7. Jim worked $2\frac{3}{4}$ hours Saturday morning and $1\frac{3}{4}$ hours Saturday afternoon. He was paid 40 cents an hour. How much did he earn on Saturday?

8. Sam's family took a trip in their car. The speedometer read 19546 at the beginning of the trip and 20032 at the end. They used 27 gallons of gasoline. How many miles did they get per gallon?

9. Tony had saved \$9.85. Today he earned \$1.50. How much does he need for a jacket costing \$15?

Thinking About Numbers

1. In the number 7256, the figure 7 has the value of 7000. What value has the 2? What is the value of the 5? The 6? Write the values of these four figures in a column and add them. Is the sum 7256?

2. In the number 18,424, the 4 in hundreds place has how many times the value of the 4 in the ones place?

3. What number comes just before 1000?

4. What Roman number comes between IX and XI?

5. Tell what numbers are missing in 1, 3, 5, ?, 9, ?, 13.

6. Tell which of these numbers can be divided exactly by 9: 87, 54, 70, 180, 108, 520, and 504.

7. What number is 36 more than 45?

8. Sixty is how many times as large as 15?

9. What number is 18 less than 48?

10. What number is 6 times as large as 12?

11. What number must be added to 86 to make 100?

12. What fractional part of 16 is 8?

13. What number is $\frac{1}{8}$ of 96?

14. How much larger is 102 than 87?

15. Which is more, $\frac{1}{2}$ hour or 28 minutes?

16. Is $\frac{3}{4}$ lb. more or less than $\frac{7}{8}$ lb?

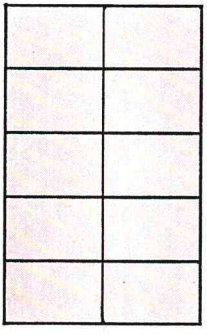
17. Which fraction is larger, $\frac{1}{6}$ or $\frac{1}{4}$?

18. Which fraction is smallest, $\frac{9}{10}$, $\frac{3}{10}$, or $\frac{7}{10}$?

19. Arrange $\frac{1}{2}$, $\frac{1}{8}$, $\frac{1}{4}$, and $\frac{1}{10}$ in the order of their value, the largest first.

20. How much larger than $\frac{2}{5}$ is $\frac{7}{10}$?

Two Ways of Adding Tenths



This year, Jill and her two sisters have their own flower gardens. Their father divided a piece of ground into 10 equal parts, as shown in the diagram at the left.

Each part is $\frac{1}{10}$ of the whole garden. Another way to write $\frac{1}{10}$ is .1, or 1 with a point in front of it. The *point* is called a decimal point. "Decimal" comes from a word meaning ten.

A number written after a **decimal point** is called a **decimal fraction.**

Jill likes gardening the best of the three sisters, so Jill got 5 parts of the garden. Five parts are $\frac{5}{10}$, or .5 of the garden.

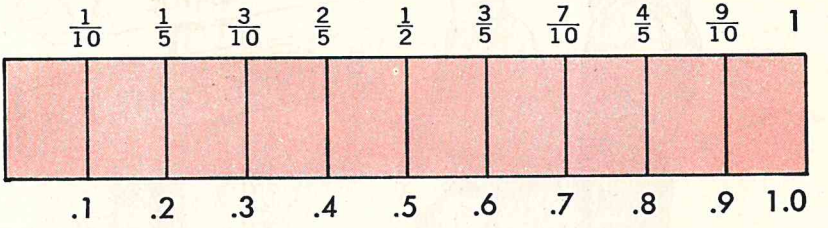
Betty got 3 parts. This is $\frac{3}{10}$, or .3, of the garden.

Kay likes to garden just a little. She got $\frac{2}{10}$, or .2 of the garden.

1. What fraction of the garden have Betty and Kay together? You may add $\frac{3}{10} + \frac{2}{10}$, or you may add .3 + .2. .3 + .2 = .5. .5 is the same as $\frac{5}{10}$. $\frac{5}{10} = \frac{1}{2}$. So .5 = ?

2. Jill and Betty together have .5 + .3, or .8 of the garden. .8 = $\frac{8}{10}$. $\frac{8}{10}$ = ?, so .8 = ?

3. Jill and Kay together have .5 + .2, or .7 of the garden. .7 is the same as what ordinary fraction? All three girls have .5 + .3 + .2 = 10 tenths or 1.0, the whole garden.



4. This is a picture of a foot ruler divided into tenths of a foot instead of inches. The decimal parts of a foot are written below the picture. Above are the ordinary or common fractions that mean the same as the decimal fractions. What decimal fraction equals $\frac{2}{5}$? $\frac{4}{5}$? $\frac{7}{10}$? $\frac{1}{2}$? $\frac{1}{5}$?

$\frac{3}{5} = \frac{6}{10}$ .6
$\frac{1}{2} = \frac{5}{10}$ .5
$\frac{7}{10} = \frac{7}{10}$ .7
$\frac{18}{10}$ 1.8
$= 1\frac{4}{5}$

5. Add $\frac{3}{5}$, $\frac{1}{2}$, and $\frac{7}{10}$ in two ways. First, add them as common fractions. Then change them to decimal fractions and add them.

Look at the box. Are the right numbers of tenths being added? Are the 2 answers equal? Which way of adding is easier?

Add these fractions in two ways.

	a	b	c	d	e	f	g
6.	$\frac{1}{2}$	$\frac{1}{5}$	$\frac{3}{10}$	$\frac{3}{5}$	$\frac{9}{10}$	$\frac{4}{5}$	$\frac{9}{10}$
	$\frac{7}{10}$	$\frac{1}{10}$	$\frac{2}{5}$	$\frac{1}{10}$	$\frac{1}{2}$	$\frac{7}{10}$	$\frac{2}{5}$
7.	$\frac{2}{5}$	$\frac{7}{10}$	$\frac{1}{2}$	$\frac{3}{5}$	$\frac{3}{10}$	$\frac{1}{5}$	$\frac{9}{10}$
	$\frac{1}{10}$	$\frac{3}{5}$	$\frac{7}{10}$	$\frac{3}{10}$	$\frac{1}{2}$	$\frac{9}{10}$	$\frac{4}{5}$
	$\frac{1}{5}$	$\frac{3}{10}$	$\frac{2}{5}$	$\frac{9}{10}$	$\frac{4}{5}$	$\frac{1}{2}$	$\frac{7}{10}$

Adding Decimal Tenths

$$\begin{array}{r} 3.7 \\ 2.8 \\ \hline 6.5 \end{array}$$

1. Tom and Bill were hiking in a state park. They saw a sign saying that Deer Lake was 3.7 miles ahead and Sunrise Point was 2.8 miles in the opposite direction.

To find how far it was from Deer Lake to Sunrise Point, add 3.7 and 2.8. See where the decimal point is written in the answer. It is placed just under the other decimal points.

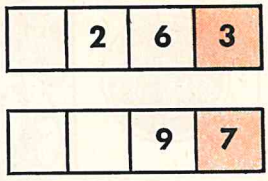
How many miles was it between Deer Lake and Sunrise Point?

Copy these examples and find the sums. Check your work by adding in the opposite direction.

	a	*b*	*c*	*d*	*e*	*f*
2.	.6	.8	3.6	.9	6.7	9.5
	.7	.9	2.5	2.4	5.0	4.5
	.9	.3	1.4	3.8	8.8	5.8
3.	7.9	3.8	7.0	81.6	112.7	51.4
	3.6	9.5	2.3	84.4	76.6	140.9
	6.8	4.5	.6	8.0	69.2	98.9
	7.4	1.4	1.7	43.5	32.6	265.9

Subtracting Decimal Tenths

1. Bill's new bicycle has a speedometer with a mileage meter to show how many miles the bicycle has gone. The lower picture shows the mileage meter when Bill started out to ride to the lake. The top picture shows the meter when he got back. Bill wanted to know how many miles he had ridden to the lake and back.



On the meter, the figure at the right shows *tenths* of miles. So you must subtract 9.7 miles from 26.3 miles.

$$\begin{array}{r} 26.3 \\ -\ 9.7 \\ \hline 16.6 \end{array}$$

Subtract just as you would with whole numbers. The decimal point in the answer is written under the other decimal points.

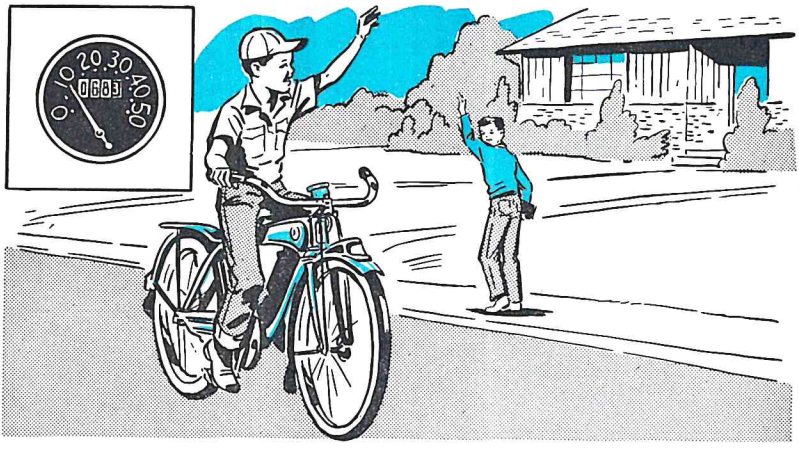
How many miles had Bill ridden?

2. Jean noticed that the speedometer in their car read 9897.6 miles when they started on a trip. It read 10205.2 miles at the end of the trip. How many miles had they gone?

Copy and subtract. Check your work by adding.

	a	b	c	d	e
3.	1.2 .9	1.3 .4	1.7 .8	3.8 2.3	5.7 5.4
4.	7.4 2.9	9.5 8.9	3.2 2.3	6.0 1.5	8.6 2.6
5.	10.9 8.4	14.5 6.8	11.0 2.7	14.6 8.0	23.4 6.7
6.	42.9 17.3	30.1 15.4	92.0 28.3	61.4 50.5	176.3 97.8

Using Decimal Tenths



1. The first month after Bill bought his bicycle, he rode 40.5 miles. The next month he rode 27.8 miles. How many fewer miles did he ride the second month than the first month?

2. Bill rode 9.6 miles on his bicycle one Saturday. The following Saturday, he rode 6.4 miles. How many miles did Bill ride on both Saturdays?

3. On the first day of one month last summer, the speedometer on Bill's bicycle read 97.8 miles. On the last day of the month the reading was 205.3 miles. How many miles did Bill ride that month?

4. Mr. Lane's car holds 17 gallons of gasoline. When Mr. Lane bought gasoline last time, it took 11.4 gal. to fill the tank. How much gasoline was in the tank before Mr. Lane filled it?

5. On a trip, Mr. Lane bought the following amounts of gasoline: 10.5 gallons, 8.7 gallons, 15.2 gallons, 12.8 gallons, and 5 gallons. How many gallons did he buy altogether?

6. At the right is part of a railroad timetable. It shows the number of miles from Barton City to several stations. To find the distance from Inwood to Bristol, subtract 9.9 miles from 65.7 miles.

How many miles is it from Inwood to Bristol?

Miles	Cities
.0	Barton City
9.9	Inwood
18.4	Bellville
30.3	Clarksburg
46.9	Merlin
65.7	Bristol
79.2	Adams
91.4	Springtown

7. On the table, find the distance from Bellville to Clarksburg.

8. Find the distance from Merlin to Springtown.

9. When Peggy was ill, her temperature was 102.3°. You have learned that a person's usual, or *normal*, temperature is $98\frac{3}{5}°$. This is the same as 98.6°. How many degrees above normal was Peggy's temperature?

10. A few days later, when Peggy was getting better, her temperature was 96.9°. How many degrees below normal was this?

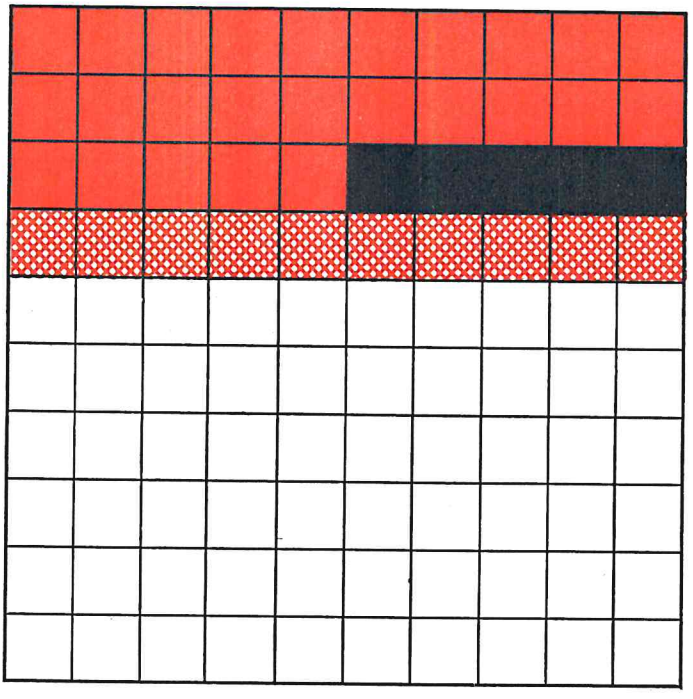
11. One month, Don's father drove his truck 508.8 miles. The next month he drove 476.5 miles. How many miles did he drive in the two months?

12. Jim ran a race in 16.7 seconds. The school record for this race is 14.3 seconds. How much slower was Jim's time for the race than the school record?

13. The four runners on a school relay team ran a relay race. The first runner's time was 15.8 seconds, the second runner's 15.2 seconds, the third 15.5 seconds, and the fourth 14.0 seconds. How many seconds did it take the team to run the race?

Have you written the decimal point in each answer?

Adding Decimal Hundredths



1. The drawing above is a square made up of 100 little squares. Each little square is $\frac{1}{100}$ of the large square. $\frac{1}{100}$ may be written .01 as a decimal. Five of the little squares are 5 hundredths, or .05, of the big square. Twenty-five little hundredths are .25 of the big square.

Think of the large square as one dollar. Then each small square stands for $\frac{1}{100}$ of a dollar, or $.01.

Twenty-five little squares are colored to show $.25 (25 hundredths, or one quarter of a dollar). Five little squares are black, to show $.05, or $\frac{1}{20}$ of a dollar. Ten squares are shaded, to show $.10, or $\frac{1}{10}$ of a dollar.

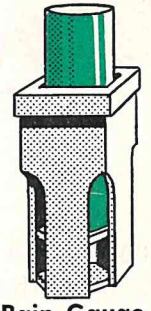
How many little squares have been colored and shaded in all? $.25 + $.05 + $.10 = ?

2. Look at the drawing of the square on page 234. How many of the little squares does it take to make $\frac{1}{2}$ of the large square? $\frac{1}{2}$ of 100 = 50, so .50 = $\frac{1}{2}$.

Write these fractions as decimal hundredths: $\frac{1}{4} = ?$ $\frac{7}{100} = ?$ $\frac{15}{100} = ?$ $\frac{1}{10} = ?$ $\frac{3}{4} = ?$ $\frac{3}{100} = ?$

3. When you are writing decimal tenths, how many figures come after the decimal point? When you are writing decimal hundredths, how many figures come after the decimal point?

4. Tom's class learned that rainfall is measured in inches and hundredths of inches. One inch of rainfall means that the rain would cover the ground 1 inch deep if it didn't run off or soak in.



Rain Gauge

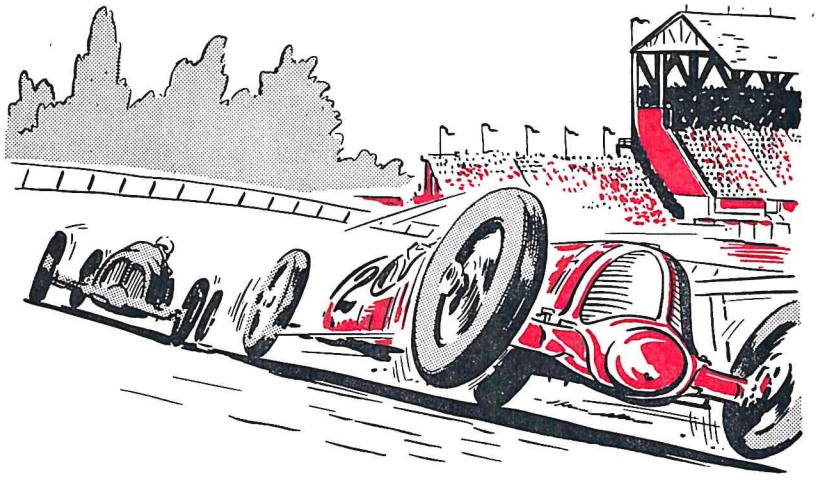
Tom called the Weather Bureau and learned that in February, 2.35 inches of rain had fallen in his town. In March, 2.77 inches of rain fell; in April, 5.51 inches fell. Find how much rain fell in all three months by adding. Put the decimal point in your answer, just below the decimal points in the example.

5. In May, 4.86 inches of rain fell. In June, 3.20 inches fell. In July 2.72 inches fell. In August, the rainfall was 8.77 inches. How much rain fell during this time?

Copy and add.

	a	b	c	d	e
6.	.35 .08	.06 .07	.54 .29	.75 .50	1.02 .78
7.	.05 .14 .60	.47 .38 .25	2.09 3.84 .65	7.15 6.60 4.75	1.26 .08 3.67

Subtracting Decimal Hundredths



1. Every year, a big automobile race is held in Indianapolis. In 1911, the first year the race was held, the winner averaged 74.59 miles per hour. Nearly 40 years later, the average speed of the winner was 124.00 miles per hour. How many miles per hour faster was this than the speed in 1911?

To find out, subtract 74.59 from 124.00. Subtract these numbers just as you subtract any other numbers. Be sure to write the decimal point in your answer, just underneath the decimal points in the example.

By how many miles per hour had the speed of the winner increased?

2. In the 1950 Indianapolis race, the first five men to come in made the following average speeds per hour: 124.00, 121.76, 121.78, 122.88, 121.77. Arrange these speeds in the order of their value, the largest first.

How many miles per hour difference is there between the fastest and the slowest of these speeds?

3. In Mobile, Alabama, the average annual rainfall is 61.79 inches. In Phoenix, Arizona, the average annual rainfall is only 7.81. How many more inches of rain fall in Mobile than in Phoenix each year, on the average?

Copy, subtract, and check.

	a	*b*	*c*	*d*	*e*
4.	.35 .20	.60 .45	.79 .52	1.38 .27	1.03 .74
5.	8.02 6.35	9.07 8.50	6.50 1.75	10.86 7.49	20.01 15.07

	a	*b*	*c*
6.	1.47 — .60	2.52 — 1.59	5.00 — 2.93
7.	13.40 — 5.03	14.25 — 9.18	24.12 — 15.77

Decimal Points Are Important

In each of the following sentences, the decimal point has been left out of a number. Rewrite each number with the decimal point in the place that makes the number most reasonable. Decimal points are important!

1. One Saturday morning Sam rode 195 miles on his bicycle.

2. The last time Mr. Lane bought gasoline, it took 114 gallons to fill his tank.

3. Jean bought a new hat for $465.

4. Tom measured the rainfall during a heavy storm yesterday. The rainfall was 231 inches.

5. Gail wants a handbag costing $1050.

6. The rug in our living room is 135 feet long.

Pages 304-307 provide enrichment material which can be used after this page.

Adding Different Kinds of Numbers

You have learned how to add whole numbers, money numbers, fractions and mixed numbers, and decimals. The following examples will show you how much you have learned and will help you improve your skills in addition. Be sure to check all your answers.

Copy these whole numbers and find the sums.

	a	*b*	*c*	*d*	*e*
1.	3	8	18	67	34
	8	5	97	13	38
	6	9	69	73	89
	1	1	54	99	175
	9	8	37	77	82
	4	9	74	44	283
	8	5			
2.	206	348	63	1432	3069
	985	402	977	706	6817
	367	990	2507	86	5761
	434	665	992	3071	6584
	225	721	787	3562	5793

Copy and add these decimal money numbers.

3.	$ .06	$ .55	$ .79	$2.97	$ 4.03
	.38	.37	1.23	.65	76.84
	.52	.96	.86	1.02	38.87
	.80	.42	3.14	.87	.60
	.09	.40	2.61	6.34	61.55
4.	$129.09	$ 65.00	$337.59	$646.45	$1277.68
	39.10	9.78	56.38	279.89	541.78
	7.75	88.97	746.69	65.48	528.49
	160.46	245.52	90.85	354.70	706.75
5.	$154.78	$283.00	$ 36.05	$445.74	$569.67
	497.65	46.76	686.83	9.89	539.84
	268.59	587.98	795.12	76.09	857.09

Copy and add these fractions and mixed numbers.

	a	b	c	d	e
6.	$\frac{3}{4}$ $\frac{1}{8}$	$\frac{1}{2}$ $\frac{5}{6}$	$2\frac{3}{4}$ $1\frac{1}{2}$	$1\frac{7}{8}$ $3\frac{1}{4}$	$2\frac{2}{3}$ $4\frac{5}{6}$
7.	$3\frac{1}{2}$ $2\frac{3}{8}$	$5\frac{4}{5}$ $1\frac{3}{10}$	$4\frac{5}{6}$ $5\frac{1}{3}$	$7\frac{3}{4}$ $6\frac{7}{12}$	$4\frac{1}{2}$ $10\frac{13}{16}$
8.	$\frac{9}{10}$ $\frac{1}{5}$ $\frac{3}{10}$	$\frac{3}{8}$ $\frac{3}{4}$ $\frac{1}{2}$	$2\frac{1}{2}$ $1\frac{3}{4}$ $3\frac{3}{4}$	$6\frac{1}{2}$ $3\frac{7}{8}$ $\frac{5}{8}$	$4\frac{1}{2}$ $8\frac{1}{2}$ $9\frac{1}{4}$
9.	$5\frac{1}{2}$ $3\frac{3}{5}$ $12\frac{7}{10}$	$14\frac{1}{4}$ $7\frac{11}{12}$ $20\frac{7}{12}$	$8\frac{5}{16}$ $7\frac{3}{4}$ $3\frac{5}{8}$	$13\frac{1}{6}$ $28\frac{2}{3}$ $14\frac{1}{2}$	42 $11\frac{9}{10}$ $89\frac{4}{5}$

Copy and add these decimals.

10.	.8 .4 .7	2.9 7.9 1.3	.55 .48 .58	3.49 .58 2.05	7.57 13.60 8.92
11.	.9 .5 .3 .8	5.3 .9 9.0 1.9	10.5 6.4 7.9 18.3	3.45 4.75 9.00 6.13	16.20 16.77 56.43 21.99

Copy in columns and add.

12. $9\frac{1}{2} + 7\frac{3}{4} + 8\frac{1}{4} + 10$

13. $3.8 + 16.1 + 4.6 + .9$

14. $3.48 + 8.72 + 12.06 + 9.69$

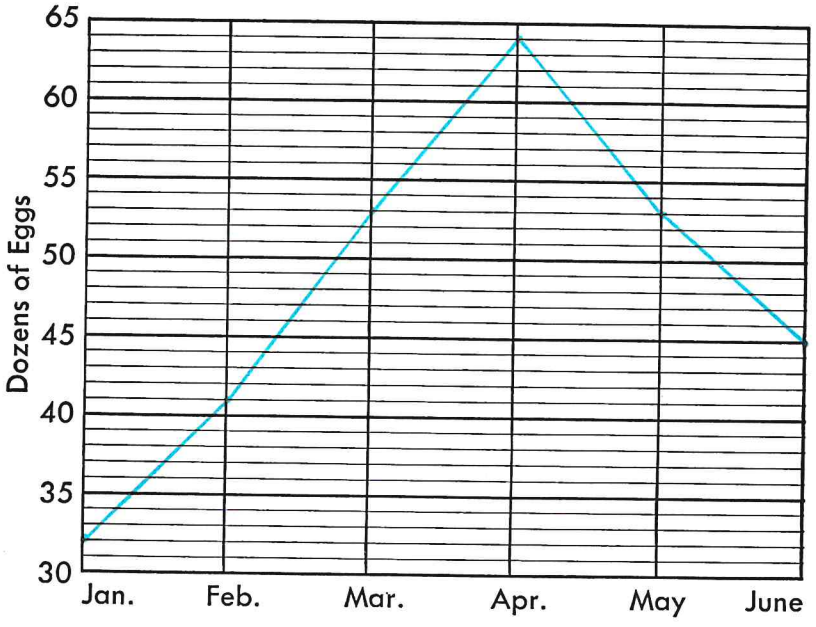
15. $846 + 49 + 3471 + 716$

16. $\$3.55 + 78¢ + \$10.75 + \$9$

17. $7\frac{3}{10} + 7\frac{1}{2} + 6 + 15\frac{4}{5}$

18. $85.7 + 8.9 + 123.8 + .7$

Using Line Graphs



Bob's Sales of Eggs

This is part of a line graph Bob made to show his record of how many eggs he was selling each month. The numbers at the side mean *dozens of eggs.*

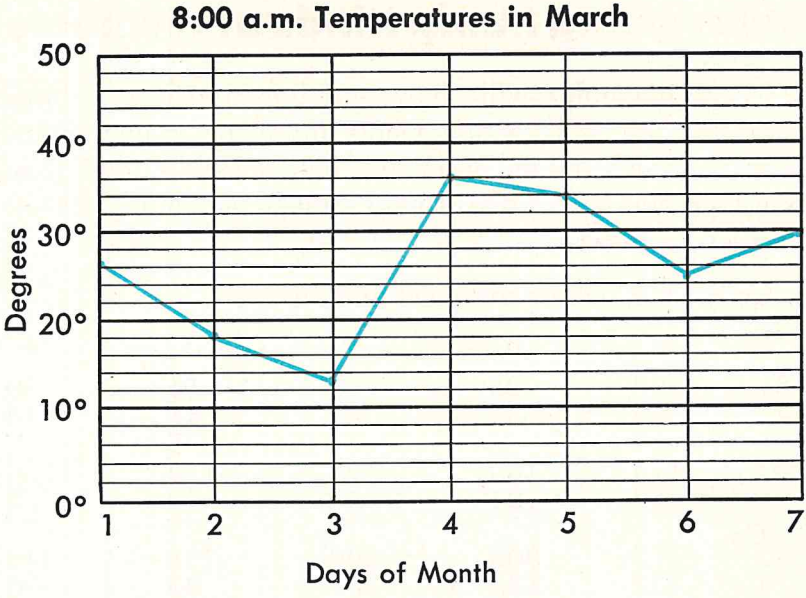
1. The graph shows that in January Bob sold 32 dozen eggs. How many dozen eggs does the graph show Bob sold in February? In March? In June?

2. In what month did Bob sell the most eggs?

3. In what month did Bob sell the fewest eggs?

4. In what two months did he sell exactly the same number of eggs?

5. How many times as many eggs did he sell in April as he sold in January?



One week in March, Tom made this line graph to show the temperature each morning at 8 o'clock. The numbers across the bottom are the dates. The numbers at the side show degrees of the temperature readings.

6. How many spaces are there between 10° and 20°? Then how many degrees does each space represent?

7. The 8 o'clock temperature on March 1 was 26°. What was the temperature on March 2? On March 3?

8. On what date was the 8 o'clock temperature the highest? On what date was it the lowest?

9. On which two dates was the 8 o'clock temperature above freezing?

10. Between what two dates was the greatest change in temperature?

11. Between what two dates did the temperature change least?

Subtracting Many Kinds of Numbers

These examples will show you how much you have learned about subtracting whole numbers, money numbers, fractions, mixed numbers, and decimals, and they will help you make sure of your subtraction skills. Check all your answers.

Copy these whole numbers and subtract.

	a	b	c	d	e
1.	79 55	85 38	92 42	56 47	60 14
2.	113 69	180 81	126 59	112 30	100 79
3.	317 182	808 425	609 531	223 80	875 326
4.	970 368	634 279	723 327	513 175	404 225
5.	1772 944	1534 760	1201 904	1245 637	1733 858
6.	8122 3076	8044 6648	6628 3932	2498 649	7800 7195

Copy these decimal money numbers and subtract.

7.	\$1.50 .97	\$1.11 .61	\$2.15 .47	\$3.57 2.68	\$6.06 4.60
8.	\$30.33 9.69	\$13.02 7.84	\$10.00 6.25	\$71.25 53.89	\$54.10 28.18
9.	\$122.20 97.49	\$104.37 46.40	\$184.95 97.88	\$829.21 681.23	\$477.46 169.77
10.	\$651.36 132.58	\$812.38 489.50	\$1021.58 530.89	\$1525.01 1005.75	\$1790.08 973.16

Copy and subtract these fractions and mixed numbers.

	a	b	c	d	e
11.	$\frac{3}{4}$ $\frac{1}{2}$	$\frac{7}{8}$ $\frac{1}{4}$	$\frac{5}{8}$ $\frac{1}{2}$	$\frac{4}{5}$ $\frac{3}{10}$	$\frac{3}{4}$ $\frac{5}{12}$
12.	$2\frac{7}{8}$ $1\frac{1}{2}$	$6\frac{3}{4}$ $2\frac{1}{4}$	$7\frac{1}{8}$ $3\frac{1}{2}$	$4\frac{3}{8}$ $1\frac{3}{4}$	$7\frac{1}{2}$ $5\frac{7}{10}$
13.	$8\frac{1}{8}$ $3\frac{3}{4}$	$4\frac{5}{8}$ $3\frac{7}{8}$	$8\frac{1}{2}$ $6\frac{1}{4}$	$9\frac{2}{3}$ $8\frac{1}{6}$	$5\frac{4}{5}$ $2\frac{9}{10}$
14.	$10\frac{7}{12}$ $3\frac{1}{3}$	$11\frac{1}{2}$ $5\frac{11}{12}$	$16\frac{2}{3}$ $9\frac{1}{6}$	$12\frac{9}{16}$ $3\frac{3}{4}$	$17\frac{7}{8}$ $8\frac{7}{16}$
15.	$21\frac{1}{2}$ $13\frac{3}{4}$	$62\frac{2}{3}$ $61\frac{5}{6}$	$50\frac{1}{5}$ $48\frac{3}{10}$	$72\frac{7}{16}$ $49\frac{7}{8}$	$45\frac{9}{10}$ $18\frac{3}{5}$

Copy these decimals and subtract.

16.	.8 .4	1.4 .9	1.0 .7	6.0 1.4	5.3 2.7
17.	12.1 8.5	16.3 5.4	15.8 7.5	75.4 25.6	138.5 57.6
18.	9.50 2.84	9.03 7.66	10.72 9.37	12.92 8.05	20.53 7.78
19.	51.06 32.08	102.7 97.9	152.36 91.67	608.1 460.6	123.18 99.09

Copy and subtract.

	a	b	c
20.	$10\frac{1}{5} - 5\frac{7}{10}$	8.2 — 6.4	\$4 — \$2.81
21.	1871 — 952	19.16 — 8.40	$17\frac{3}{4} - 8\frac{5}{12}$
22.	14.4 — 7.8	$20\frac{1}{2} - 9\frac{5}{6}$	105.5 — 83.7
23.	8616 — 1049	126.04 — 33.06	\$3 — 35¢
24.	\$108.05 — \$71.49	100.3 — 12.9	$120\frac{7}{8} - 26\frac{5}{16}$

Using a Price List

Apples	2 lb. 15¢
Bread	2 loaves 29¢
Buns	6 for 19¢
Corn	4 cans 73¢
Grapefruit	3 for 20¢
Orange juice (frozen)	3 cans 73¢
Peaches (frozen)	3 pkg. 59¢
Soap	6 bars 55¢
Spiced ham	$\frac{1}{4}$ lb. 27¢
Tomato juice	4 cans 77¢

Here are some things on a price list Sally used when she bought some groceries for her mother. Use these prices in working the following problems.

$$\begin{array}{r} 7\frac{1}{2} \\ 2\overline{)15} \\ \underline{14} \\ 1 \end{array}$$

1. Two pounds of apples cost 15 cents. Then 1 pound will cost $15 \div 2$, or $7\frac{1}{2}$ cents. But, if Sally buys only one pound of apples, she will have to pay 8 cents.

How much will Sally have to pay for 1 loaf of bread?

2. How much will Sally have to pay for 1 grapefruit?

Find how much Sally must pay for:

3. One package of frozen peaches.

4. One can of corn.

5. One can of frozen orange juice.

6. One bar of soap.

7. One fourth of a pound of spiced ham costs 27 cents. At this rate, how much would a whole pound (4 fourths) cost?

8. Sally wants to buy 6 grapefruit. Six grapefruit are 2 times as many as 3, so how much must Sally pay for 6 grapefruit?

9. How much would a dozen buns cost?

10. How much would Sally have to pay for 1 can of tomato juice? At this rate, what would 4 cans of tomato juice cost? How much can Sally save by buying 4 cans at the price given in the list?

11. At the price shown in the list, how much would a dozen cans of corn cost?

12. How much money will Sally save by buying 6 bars of soap at one time instead of buying 1 bar at a time?

13. When Sally was waiting to pay for her purchases, she noticed that the woman just ahead of her in the line had bought a loaf of bread, 6 grapefruit, and 6 cans of frozen orange juice. What was the woman's total bill?

14. The woman behind Sally had bought a dozen buns and a pound of spiced ham. How much would she have to pay?

15. Mrs. Lane wants to buy 15 packages of frozen peaches for a church supper. How much will she have to pay?

Practice in Multiplication

Work the following examples to see how much you have learned about multiplication. Make sure your work is correct, either by going over it or by multiplying again.

Can you multiply by one-figure numbers?

	a	b	c	d	e
1.	17 × 4	38 × 2	96 × 5	524 × 7	309 × 6
2.	850 × 7	2618 × 6	6709 × 8	2970 × 4	2009 × 9

Can you multiply by two-figure numbers?

3.	96 × 34	79 × 27	38 × 19	82 × 50	64 × 28
4.	149 × 25	407 × 69	348 × 95	596 × 87	756 × 36

Can you multiply by three-figure numbers?

5.	572 × 128	704 × 137	850 × 246	590 × 295	1283 × 378

Can you multiply money numbers?

6.	\$ .69 × 8	\$5.17 × 9	\$4.38 × 48	\$3.80 × 75	\$1.75 × 50
7.	\$ .37 × 20	\$8.89 × 3 00	\$9.40 × 3 07	\$6.05 × 4 09	\$4.95 × 2 60

Can you multiply by mixed numbers?

8.	24 × $4\frac{1}{4}$	15 × $3\frac{2}{3}$	96 × $1\frac{1}{6}$	48 × $6\frac{1}{2}$	36 × $2\frac{3}{4}$

Practice in Division

See how much you have learned about division.

Divide these whole numbers and check.

	a	b	c	d
1.	$7\overline{)98}$	$4\overline{)340}$	$6\overline{)414}$	$5\overline{)1800}$
2.	$34\overline{)816}$	$26\overline{)520}$	$16\overline{)768}$	$40\overline{)680}$
3.	$73\overline{)4307}$	$96\overline{)8256}$	$38\overline{)2622}$	$85\overline{)3315}$
4.	$20\overline{)7600}$	$14\overline{)5110}$	$92\overline{)72680}$	$75\overline{)60450}$

Divide these decimal money numbers and check.

5.	$6\overline{)\$8.82}$	$5\overline{)\$3.70}$	$9\overline{)\$7.56}$	$4\overline{)\$24.16}$
6.	$85\overline{)\$47.60}$	$19\overline{)\$15.01}$	$55\overline{)\$101.75}$	$97\overline{)\$145.50}$

Reducing Fractions in Quotients

1. Bob's hens laid 162 eggs one week. To find how many dozen eggs this is, divide by 12.

$$12\overline{)162} \qquad 13\tfrac{6}{12} = 13\tfrac{1}{2}$$
$$\underline{12}$$
$$42$$
$$\underline{36}$$
$$6$$

There is a final remainder, 6. This may be written as the numerator of a fraction with the divisor (12) as the denominator. (The fraction $\frac{6}{12}$ means that 6 is divided by 12.)

But $\frac{6}{12}$ can be reduced (changed) to $\frac{1}{2}$. How many dozen eggs did Bob get that week?

Copy and divide. Reduce your answers to lowest terms.

2.	$8\overline{)390}$	$4\overline{)374}$	$6\overline{)352}$	$8\overline{)562}$
3.	$24\overline{)1360}$	$36\overline{)1269}$	$60\overline{)1950}$	$50\overline{)1475}$

Problems Using Three Processes

There are three steps in each problem on this page. You will need to use three processes to solve each problem. Number your paper 1 to 6. After each number, write the signs to show which processes you use to solve that problem. So, for Problem 1, write: "1. ÷ × +," because you *divide* to find the number of dozens, *multiply* to find how much Bob got for his eggs, and *add* to find how much he got in all. Then find and write the answers.

1. One week Bob gathered 156 eggs. He sold them for 54 cents a dozen. He also sold some chickens for $3.60. How much money did Bob get that week?

2. Jean got $3.00 for an Easter present. She spent $1.29 for a new paint brush and 20 cents a tube for 6 tubes of paint. How much of her money did she have left?

3. When Bill started on a bicycle trip, his speedometer said 56.8 miles. Three hours later, the speedometer said 80.8 miles. At that rate, how far could Bill go in $4\frac{1}{2}$ hours?

4. Twenty boys and girls in Sue's class are going on a picnic. They are to have 3 sandwiches apiece. If Sue and Jill have already made 15 ham sandwiches and 8 cheese sandwiches, how many more sandwiches must they make?

5. Sally wants to buy 3 yd. of material at 79¢ a yard, a pattern for 25¢, some thread for 8¢, and some buttons for 29¢. How much change will she get from $5?

6. Allen bought 4 rolls of film for his camera, at 50 cents a roll. It cost him $2.76 to get his films developed and printed, and 28 of the pictures turned out to be good. How much did each good picture cost Allen?

Pages 308 and 309 provide enrichment material which can be used after this page.

Vacation Problems

The problems on this page show you some of the ways you may be using arithmetic during your vacation this summer.

1. Bill and Tom went hiking with Bill's father. They climbed $2\frac{1}{2}$ miles on a trail up a mountain. A sign there said, "$\frac{7}{8}$ mile to the top." When they reached the top, how many miles had they climbed?

2. It took them $3\frac{1}{4}$ hours to climb the mountain and $1\frac{3}{4}$ hours to come down. How much longer did it take them to climb than to come down?

3. Bob went fishing with Sam. Bob caught two fish, one weighing $1\frac{1}{2}$ pounds and the other $\frac{7}{8}$ pound. Sam caught one fish weighing $2\frac{5}{8}$ pounds. How much more did Sam's fish weigh than both of Bob's together?

4. Some Boy Scouts took a three-day hike in the mountains. From the map, the boys found that they had walked 10.8 miles the first day, 7.5 miles the second day, and 8.7 miles the third day. How many miles did they go?

5. On the first day of a 476-mile vacation trip we drove 196 miles. If we average 35 miles an hour, how many hours will it take us to finish the trip?

6. Bill planned to take a three-day bicycle trip with some friends. They intended to ride 7 hours each day. If they averaged 7 miles an hour, how many miles would they go?

7. Peggy rented her bicycle to her friends for 10¢ a ride or 35¢ an hour. One day she rented it to Sally for 3 hours and to other girls for 7 rides. How much did Peggy earn with her bicycle that day?

Pages 310 and 311 provide enrichment material which can be used after this page.

Can You Work With Numbers?

Diagnostic Check Test 4A

This test will show you how much you now know about working with numbers of different kinds.

Copy, add, and check.

	a	*b*	*c*	*d*	e
1.	457	$ 39.75	31.6	25.85	$3\frac{1}{2}$
	6806	13.94	54.4	8.58	$1\frac{1}{4}$
	70	8.50	9.6	9.26	$1\frac{3}{8}$
	2359	132.25	9.0	217.67	2
	418	45.06	47.7	39.46	$5\frac{3}{4}$

Copy, subtract, and check.

2.	104	910	1572	$10.23	$25.00
	45	586	964	2.37	16.95
3.	14.5	73.07	$5\frac{1}{2}$	$7\frac{11}{12}$	$16\frac{1}{3}$
	5.8	48.09	$2\frac{9}{10}$	$3\frac{1}{4}$	$7\frac{5}{6}$

Copy, multiply, and check.

4.	68	349	$6.40	$5.80	$1.20
	43	207	15	90	$3\frac{1}{4}$

Copy, divide, and check.

5. $7\overline{)476}$ $32\overline{)1568}$ $20\overline{)7360}$ $13\overline{)7007}$ $74\overline{)8901}$

6. $4\overline{)\$3.84}$ $56\overline{)\$3.92}$ $41\overline{)\$80.77}$ $40\overline{)\$50.00}$ $93\overline{)\$604.50}$

Copy, work, and check.

	a	*b*	*c*
7.	6705 + 896	708 × 945	$10 − $6.07
8.	$97.44 ÷ 24	7.8 + 14.9	$3\frac{1}{2}$ × $1.60
9.	$4\frac{3}{4} + 3\frac{7}{8}$	$6 - 4\frac{5}{12}$	$8\frac{3}{10} - 2\frac{1}{2}$

Do You Understand Numbers?

Diagnostic Check Test 4B

1. Write \$3.86 to the nearest dollar.

2. Round 938 to the nearest hundred.

3. Write the smallest number you can, using each of the following figures once: 4, 2, 5, 3, 1.

4. How many millions are there in 27209500?

5. Twenty is how many times as large as 5?

6. What is the smallest number of coins you can use in making change from 1 dollar for a purchase of 34 cents?

7. What fraction of 16 is 4?

8. Seven is how much less than 12?

9. How much larger is 25 than 15?

10. Which fraction is smallest, $\frac{1}{6}$ or $\frac{1}{9}$ or $\frac{1}{5}$?

11. Change $\frac{2}{3}$ to 12ths.

12. Is $\frac{3}{4}$ lb. more or less than 13 oz.?

13. Is $\frac{5}{8}$ in. longer or shorter than $\frac{1}{2}$ in.?

14. Write .5 as a fraction reduced to lowest terms.

15. Write 1.2, 12, and .12 in the order of their value, the smallest first.

16. Write $\frac{7}{100}$ as a decimal.

17. Find the perimeter of a square with each side 9 feet long.

18. On a scale drawing in which $1'' = 4'$, how many feet does a line $1\frac{1}{2}$ in. long stand for?

19. What Roman number comes just before XX?

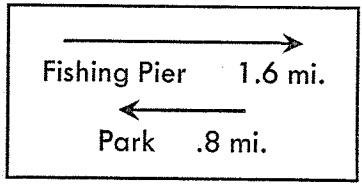
Can You Use Arithmetic?

Diagnostic Check Test 4C

This test will help you check up on how well you can use arithmetic in solving problems. Make sure that all your answers are reasonable.

1. Sue wants to make a cake. One recipe calls for $1\frac{1}{2}$ cups of sugar and another recipe calls for only $\frac{3}{4}$ cup. How much more sugar does the first recipe call for?

2. Jerry watched television $1\frac{3}{4}$ hours on Friday and $3\frac{1}{2}$ hours on Saturday. How much time did he spend on television on both days?



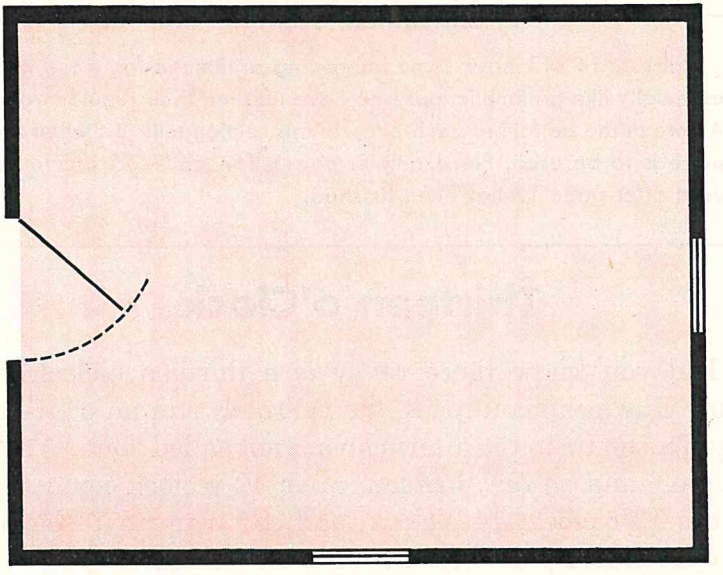
3. Last summer Larry's family went to the seashore for their vacation. Larry saw this sign on the boardwalk. How many miles was it from the fishing pier to the park?

4. Sally bought a piece of ribbon $\frac{3}{4}$ yard long. She used 20 inches of the ribbon. How many inches were left?

5. For a science project, Tom kept a record of the rainfall in his city as reported by the Weather Bureau. In April, the rainfall was 4.03 inches. In May, it was only 1.87 inches. How many inches more rain fell in April than in May?

6. How many inches of picture molding will Dick need to make a picture frame 24 in. long and 18 in. wide? How many feet is this?

7. On a trip, we drove 1168 miles in 4 days. Estimate to the nearest hundred miles our average distance each day. Then find the exact average.



8. The boys in Dave's club are planning to build a club house. Above is the scale drawing they made. The scale is $1'' = 4'$. Measure the drawing to find how many feet long and how many feet wide the house is to be inside.

9. At a sale, 3 boxes of soap flakes were sold for 78¢. The regular price was 30¢ a box. How much will Mrs. Lane save by buying 3 boxes at the sale?

10. Bob sold 3 chickens weighing 5 pounds, $6\frac{1}{4}$ pounds, and $3\frac{3}{4}$ pounds. Find their average weight.

11. Don's father has 20 gallons of maple sirup to sell. If he gets 90 cents a quart for it, how much should he get for all his sirup?

12. One winter day, the temperature rose from 8° to 33°. On a spring day, it rose from 39° to 80°. How much more did the temperature rise on the day in the spring?

Enrichment Section

Pages 254-311 have some interesting arithmetic for those who especially like arithmetic and who have finished their regular work. A note at the bottom of each page in this section tells just when the page is to be used. For example, pages 254 and 255 are to be used after page 13 has been finished.

Thirteen o'Clock

1. Did you know there really *is* a thirteen o'clock? In many European countries, the railroads run on a 24-hour day. The hours in the afternoon are not called "one," "two," "three," and so on. Instead, after 12 o'clock noon there comes 13 o'clock, 14 o'clock, and so on up to 24 o'clock. 13 o'clock is 1 p.m. What time is 14 o'clock?

2. What time in the afternoon is 16 o'clock?

3. What time is 19 o'clock? 21 o'clock?

4. This system is used because it keeps people from mixing up morning and afternoon times. If we say just "8 o'clock," we can't tell whether it means 8 o'clock in the morning or 8 o'clock in the evening. If a train leaves at 3:12 by our time system, we have to find out whether it is 3:12 a.m. or 3:12 p.m.

But in European countries, 3:12 is always during the night. In the European timetable, 3:12 in the afternoon would be printed as 15:12 instead. How would 1:07 p.m. be printed? 2:40 p.m.? 6:38 p.m.?

5. Last Saturday night Bill watched a television show and did not get to bed until 22:30 o'clock. He asked his mother to call him after he had slept for 10 hours. At what time Sunday morning should his mother have called him?

Pages 254 and 255 are to be used after page 13.

6. You can change our afternoon time to the European time by adding 12 to our hours. So 7:27 is 19:27, and 11:09 is ?. You can change the European time to our afternoon time by subtracting 12. So 22:18 is 10:18 p.m., and 20:46 is ?.

7. A helpful way to show how the 24-hour system compares with our two 12-hour system is to draw a clock face. Write the numbers 13 to 24 outside the clock, 13 opposite 1, 14 opposite 2, 15 opposite 3, and so on.

8. We are going to have dinner at half-past 17 o'clock. Our favorite television program starts at 19 o'clock. How much later is this?

9. It is exactly a 7-hour train trip from Chicago to Bill's city. If Bill's uncle leaves Chicago at 14:10, when should he arrive in Bill's city? What time is this by our time?

10. Dick is making a table. One Saturday, he worked on his table from ten o'clock until 13:30. How long did he work on his table that day?

11. Nora's school day starts at 9 o'clock and ends at 15 o'clock. How many hours a day does Nora spend in school?

12. Ann goes to school at half past 9 and gets out at half past 15. She has one hour for lunch at the cafeteria. How many hours does she spend on her school work?

13. By 24-hour time, a train started from New York City at 5 o'clock and got to Cleveland 12 and a half hours later. What time was it then? What time is this by our time?

14. A football game started at 14 o'clock and ended two and three quarters hours later. Can you write the time the game was over?

Pages 254 and 255 are to be used after page 13.

Grocery Store Arithmetic

Dan's father owns a grocery store. Dan likes to help in the store on Saturdays, sometimes, waiting on customers and making change. When he makes change, he has to be very careful, of course, to count the money out right and give the customer the correct amount.

Here are some of the problems Dan had to do when he worked in the store.

1. Mrs. Clark bought a can of corn for 21 cents, a loaf of bread for 17 cents, and some meat for 93 cents. How much should Dan charge her?

2. Mrs. Clark gave Dan a dollar and fifty cents. How much money should she get back?

3. Dan gave Mrs. Clark 6 coins in change. What coins were they? How did Dan count out the change?

4. Mr. Barr bought groceries costing 67 cents. "I'll give you the exact amount," he told Dan and handed him 2 quarters, 3 nickels, and 2 pennies. Was this the right amount of money?

Pages 256 and 257 are to be used after page 16.

5. Sally came in with a shopping list for her mother. Sally wanted: 1 dozen oranges for 49 cents; a can of soup for 19 cents, a box of crackers for 27 cents; a head of lettuce for 22 cents; 2 pounds of sugar for 19 cents; and a can of fruit for 35 cents. What was the total amount of Sally's bill?

6. Sally handed Dan two dollar bills. How much change should Dan give her? List the smallest number of coins Dan could use in making this change.

7. Mrs. Parker bought a roast for $2.73, some tomatoes for 39 cents, some frozen peas for 22 cents; a dozen eggs for 69 cents; and two pounds of coffee for $1.47. How much did Mrs. Parker spend?

8. Mrs. Parker handed Dan a $10 bill. What is the smallest possible number of pieces of money he could give her in change? What pieces of money would they be?

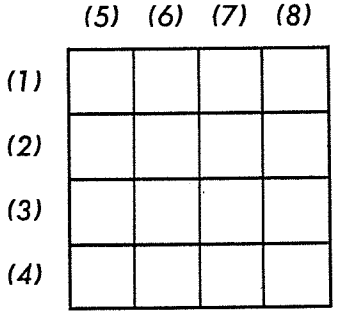
9. Dan gave Miss Johnson 2 pennies, a nickel, a dime, and 2 quarters in change. How much change did he give her? Miss Johnson had bought $4.28 worth of groceries and had handed Dan a five-dollar bill. Did Dan give her the right amount of change?

10. A man bought some canned goods for $1.62 and gave Dan a five-dollar bill. Dan started to give the man back three pennies, a dime, a quarter, and four dollar bills. How much change would this have been? What was the right change?

11. A girl bought some cake mix for 27 cents and gave Dan a dollar. Dan gave her 3 pennies, 4 dimes, a nickel, and a quarter. Dan's father said, "You could have given her only 6 pieces of money, Dan." What are the 6 coins Dan could have used?

Pages 256 and 257 are to be used after page 16.

A Cross-Number Puzzle



On your paper, draw a square like this. Work the following problems and write your answers in the square. Write the answers to Problems *1*, *2*, *3*, and *4 across* the square. Write the answers to Problems *5*, *6*, *7*, and *8 down*. The answers *down* should check the answers *across*.

1. Jim was 10 years old in 1952. When was he born?

2. In what year will Jim be 21 years old?

3. Last year, Larry's father drove his car 15,248 miles. So far this year, he has driven 9,076 miles. How many miles farther did he drive his car last year than he has driven it this year?

4. Two loads of coal were delivered at Ann's house today. There were 8,450 pounds in the first load and 10,200 pounds in the second load. How many more pounds were there in the second load than in the first load?

5. Sue's father drove his truck 405 miles in April and 756 miles in May. How many miles did he drive in both months?

6. The speedometer in Mr. Lane's car read 16849 miles at the beginning of the year. Now it reads 26766. How many miles has Mr. Lane driven so far this year?

7. Jerry has 998 stamps in his collection. His father has 3677 stamps. How many stamps are in both collections?

8. The high school in Bill's city has 1233 boys and 1087 girls. How many pupils are there in the high school?

Pages 258 and 259 are to be used after page 19.

Making Your Own Questions

The problems on this page do not have any questions. Complete each problem by making up a question for it. Your question will make it either an addition problem or a subtraction problem. Then solve the problem. Write your questions and your answers on another paper.

1. Last week Tom earned $1.25. This week he earned $1.70. (You can make this either a subtraction problem or an addition problem.)

2. Ann had 200 picture post cards in her post card collection. Then she sent 27 of them to a "pen pal" who lived in Canada.

3. Peggy bought a sweater that cost $3.39. She handed the clerk a five-dollar bill.

4. Jim's big brother raises tropical fish. One day he sold some angel fish for $3.85 and some guppies for $1.93.

5. Bill bowled two games today. In the first game, he made 54 points. In the second game, he made 73 points.

6. Last summer, we took a trip of 2917 miles in our car. Before we started the trip, the car had gone 24,538 miles.

7. Last year Allen took 72 pictures with his camera. This year he has already taken 120 pictures.

8. Nora is reading two books. One book has 178 pages and the other book has 209 pages.

9. Dick has a board 50 inches long. He sawed off a piece 18 inches long.

10. Don sold some tomatoes from his garden for 76 cents and some corn for $1.09.

Pages 258 and 259 can be used after page 19.

At the Post Office

Jerry is treasurer of his stamp club. Every once in a while, Jerry goes to the post office to buy new issues of stamps for the members of his club. Since he is spending the club's money, he has to keep a careful account of it.

Here are some of the problems Jerry had to solve. See whether you can do them. Perhaps you can work some of them as quickies.

1. On one trip to the post office, Jerry bought 45 new 6-cent airmail stamps. What was the total cost of these stamps?

2. Jerry handed the clerk a five-dollar bill. The clerk gave him four pieces of money in change. What pieces of money do you think Jerry got? How much change did he get?

3. There are 9 boys in Jerry's stamp club. They shared the 45 airmail stamps equally. How many stamps did each boy get? How much did each boy's stamps cost?

Pages 260 and 261 are to be used after page 29.

4. Another time, a new 3-cent stamp came out. Three boys wanted 5 stamps each, 2 boys wanted 8 stamps each, and 4 boys wanted 10 stamps each. How many stamps did Jerry ask for? How much did he have to pay for them?

5. Once, Jerry bought twenty-seven 7-cent stamps and eighteen 9-cent stamps. How much did these stamps cost?

6. When he bought these stamps, he gave the clerk $4.00. How much change did he get? What is the smallest number of coins the clerk could give him in change?

7. Jerry saw a man mail five packages. Three, just alike, cost 27 cents each to send. One cost 54 cents, and a big one cost $1.24. How much did it cost to send all five?

8. It costs 3 cents an ounce to send a regular letter. Special delivery costs 20 cents extra. How much does it cost to send a 3-ounce letter by special delivery?

9. Insuring a package against being lost costs:

Value of Package	Cost of Insurance
not over $5	5¢
from $ 5.01 to $10	10¢
from $10.01 to $25	15¢
from $25.01 to $50	20¢

Jerry's mother wants to insure a package for $25. The postage on the package is 46 cents. How much must she pay in all?

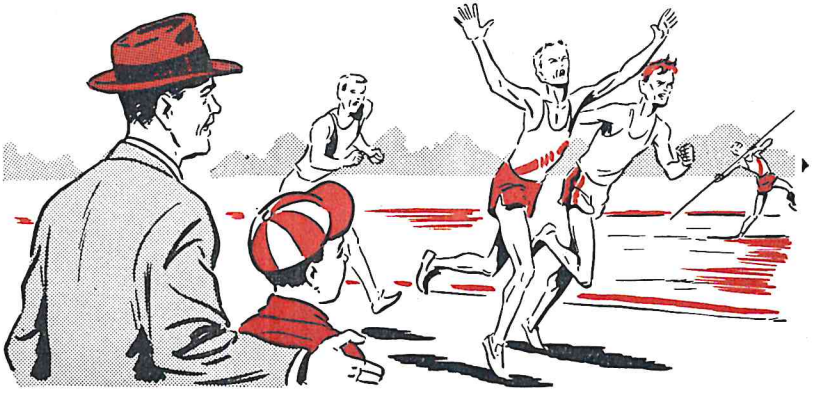
10. Jerry's mother is secretary of a women's club. Once she asked Jerry to get these things at the post office:

150 3-cent stamps
100 2-cent postcards
20 6-cent air-mail stamps
5 20-cent special delivery stamps

How much did these all cost?

Pages 260 and 261 are to be used after page 29.

Bill Sees a Track Meet



When Bill's father went to college, he used to be a runner on his college track team. Last spring, he took Bill back to his college to see a track meet.

First came the *track* events—the running races and the relays, and the hurdle races. Then came the *field* events—the high jump, the broad jump, the pole vault, and the javelin and discus throws.

Bill was glad he had studied measures in school. Knowing about measures made the track meet more interesting to him.

See if you can solve the problems Bill had. You may be able to work some of them as quickies.

1. The man who won the 100-yard dash ran it in 10 seconds. How many *feet* a second was this?

2. The man who won the 440-yard race ran it in 49 seconds. How much less than a minute was this? What fraction of a mile is 440 yards?

3. The 880-yard race was run in 2 minutes. At this rate, how long would it have taken to run a mile?

Pages 262 and 263 are to be used after page 35.

4. The 220-yard hurdle race was run in 25 seconds. The 440-yard hurdle race took 58 seconds. The second race took how many seconds longer than twice as long to run as the first?

5. In a relay race, 4 men ran a total of $\frac{1}{2}$ mile. How many *yards* did each man have to run?

6. The total time for this relay race was one minute and 40 seconds. How many seconds was this? On the average, how many seconds did each runner take?

7. In another relay race, 4 men ran a total of 2 miles. What part of a mile did each man have to run?

8. The winning time in the 2-mile run was 10 minutes. The runner went how many times as fast as a man walking a mile in 15 minutes?

9. The winning high jump was 6 ft. The best pole vault was 14 ft. The pole vaulter went how many times as high as the high jumper?

10. The next highest jump was 5 ft. 10 in. How many inches less than 6 ft. was this?

11. The second best pole vault was 13 feet and 5 inches. How much over 4 yards was this?

12. The discus throw was 168 ft. The javelin throw was 225 ft. How many *yards* farther was the javelin throw than the discus throw?

13. One of the field events at a track meet is throwing a heavy hammer. The winning hammer throw Bill saw was 167 ft. Bill's father said that, when he was in college, a classmate of his once threw the hammer 179 feet. How many feet farther was this than the hammer throw Bill saw? How many *yards* farther was it?

Pages 262 and 263 are to be used after page 35.

Multiplication or Division Questions

Some of the problem situations below are multiplication situations. Some of them call for division. See if you can write a question for each problem that will make it a multiplication or division problem. Write your questions and answers on your paper.

1. Ann wanted to buy 4 little silk scarfs for Christmas presents. Each scarf cost 36 cents.

2. Jerry's stamp club recently bought a packet of 189 French stamps. There are 9 boys in the club.

3. The whole packet of French stamps for the 9 boys in Jerry's club cost $7.56.

4. Dick is building a set of shelves. He wants to cut 6 short pieces of board each 18 inches long.

5. Last summer, Tom cut Mrs. Barr's lawn for her. He cut it 8 times. Mrs. Barr paid him $1.20 each time he cut the lawn.

6. The 7 boys in Bill's club want to earn money to buy a portable radio for their clubroom. They can get a small radio for $29.40.

7. Jill's class gave a play to raise money to buy a picture for their room. Jill sold 5 tickets for 15 cents each.

8. Each of the 7 boys in Bill's club pays dues of $1.40 a year.

9. Don is helping his father load 8 baskets of apples into the farm truck. Each basket of apples weighs 48 pounds.

10. Larry has 84 rocks in his rock collection. He wants to put the rocks in 3 trays for the school hobby show.

Pages 264 and 265 are to be used after page 39.

Can You Work Old Problems?

These problems were taken from an arithmetic book printed more than one hundred years ago. They were called "Practical Problems." Solve them. Do you think that these problems were really "practical"?

1. Minnie had 381 cents in her money bank, and took out 176 cents to give to a little beggar-girl; how many cents remained?

2. Maria gave a poor old soldier ninety-six cents, Annie gave him eighty-seven cents, and Carrie gave him one hundred and nineteen cents. How much did the old soldier receive?

3. Effie and Eddie together took 1424 steps in going to school. How many steps did Eddie take, if Effie took 691?

4. Thomas wrote 732 spelling words in two weeks. He wrote 354 spelling words the first week. How many words did he write the second week?

5. William bought a knife for 39 cents, a hoop for 73 cents, a book for 58 cents, and a top for 86 cents. He sold them at a gain of 26 cents. What did he receive for them?

6. What must I pay for 16 cows, if I pay 27 dollars for each cow?

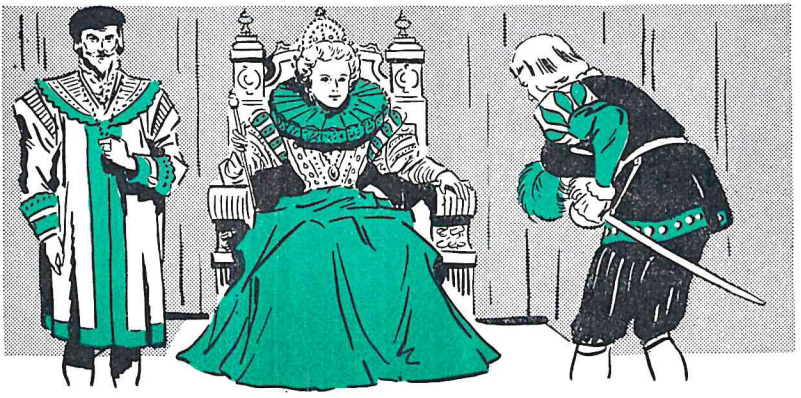
7. If 28 men do a piece of work in 46 days, how long will it take one man to do it?

8. At 11 cents a quart, how many quarts of cherries can you buy for 1232 cents?

9. A lady divides 3645 dollars equally among 9 girls. How many dollars will each receive?

Pages 264 and 265 are to be used after page 39.

Long Tons and Short Tons



"Good Queen Bess"

The ton generally used in this country is 2000 pounds. It is sometimes called a **short ton.**

There is also a **long ton,** which is used in England, and which we use when we ship freight to other countries.

In the time of Queen Bess, a measure called a **stone** weighed 14 pounds. It took 8 **stones** to make a **hundredweight** (8 × 14 pounds). A hundredweight was 112 pounds instead of 100 pounds. Since a long ton equals 20 of these hundredweight, a **long ton** equals 20 × 112 lb. or 2240 lb.

A funny word that shippers use in weighing freight is **kip.** A **kip** is **half a short ton,** or 1,000 pounds.

1. Tony was talking to a man at the zoo. The man said their biggest elephant weighed 5 tons. Some kinds of whales weigh 70 tons. A 70-ton whale would be how many times as heavy as the zoo's biggest elephant?

2. The man told Tony that the rhinoceros in the zoo weighed 6,000 lb. The hippopotamus weighed 8,000 lb. How many tons heavier was the hippopotamus?

Pages 266 and 267 are to be used after page 43.

3. Don and his father were riding in their truck. The truck weighed 4,000 lb., and there were 1500 lb. of apples on it. Don and his father together weigh about 200 lb. How many pounds did the truck, the apples, and Don and his father weigh?

They came to a bridge marked "Load limit 3 tons." How many pounds lighter was the truck and its load than the limit for the bridge?

4. Mr. Lane's new car weighs 3280 lb. Mr. Lane weighs 158 lb., Mrs. Lane 130 lb., Tony 115 lb., and Jean 98 lb. How much less than 2 tons do the Lanes and their car weigh?

5. Five *long* tons of tea equal how many pounds? How many pounds equal 5 *short* tons? The 5 long tons equal how many more pounds than 5 short tons?

6. How many pounds less than half a long ton is a kip?

7. Can you answer the questions in the following story?

a. An American merchant sent 7 short tons, a kip, and a hundredweight of sugar, in American weight, to a merchant in England.

(How many pounds was this?)

b. The English merchant had not understood that the shipment was to be in American weights. He expected to get 7 long tons of sugar, a kip, and a British hundredweight of 112 pounds.

(How many pounds of sugar did the Englishman expect to get? The shipment was how many pounds short of this?)

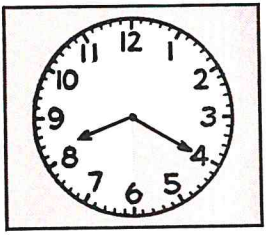
c. When the American merchant understood the trouble, he said he would send another kip and seven 100-pound hundredweights of sugar to the Englishman.

(How many pounds did he send? How many more pounds did the Englishman get than he thought he was entitled to?)

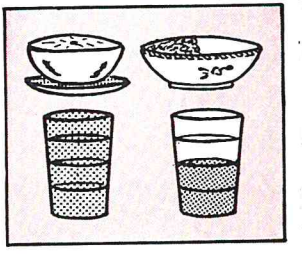
Pages 266 and 267 are to be used after page 43.

Tom Meets Some Fractions

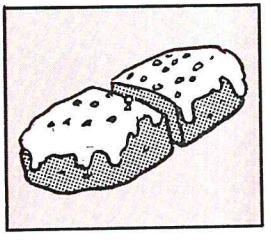
See if you can find all the missing numbers in this story of the fractions Tom met one day. The pictures will help you. Tell the missing numbers or write them on your paper.



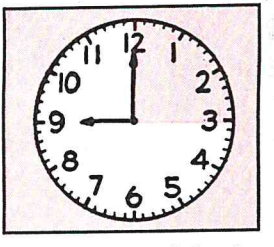
1. Tom's alarm clock didn't go off. Finally his mother called him and said, "Tom, you have just 10 minutes to get ready for breakfast." Tom has one ? of an hour to get ready for breakfast.



2. For breakfast, Tom ate ? of a grapefruit and ? of his bowl of cereal. He ate an egg and drank ? glasses of milk. He took his sweet roll to school with him, wrapped in a paper napkin.



3. In Tom's city, 8 blocks make a mile. Tom walked 1 block to Jim's house. This was one ? of a mile. Jim and Tom walked another block to school. This was another ? of a mile. In all, Tom walked one ? of a mile to school.



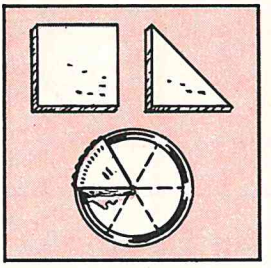
4. Tom shared his sweet roll with Jim. Each boy had ? of the roll.

5. The school assembly program started at 9 o'clock and lasted until 9: 15. It lasted ? minutes, or one ? of an hour.

6. Social studies started at 9: 15 and lasted until 10 o'clock. The social studies period lasted ? minutes, or ? of an hour.

Pages 268 and 269 are to be used after page 51.

7. In social studies, 5 pupils wanted to use a special reference book. If they divided the 45 minutes equally, each one could keep the book ? of the time, or ? minutes.



8. The picture shows part of Tom's lunch. Tom had ? sandwiches. He had one ? of a pie.

9. Ann brought 5 cookies to school. She shared them equally with Jean and Tom. What fraction of the cookies did Tom get? How many cookies did he get?

10. After school, Tom walked 3 blocks to Bill's house. Each block was $\frac{1}{8}$ of a mile, so this was ? of a mile. Then Tom walked 3 more blocks to his own house. Tom walked ? of a mile home from school.

11. While Tom was at Bill's house, Jim came in with 2 apples his mother had just given him. The three boys shared the two apples equally. What part of an apple did Tom get?

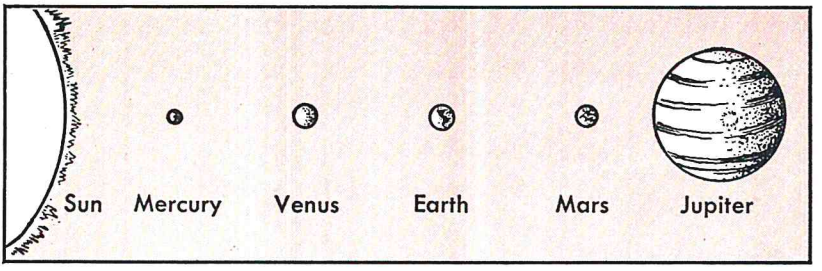
12. After Tom got home, his mother asked him to go to the store to buy some groceries for her. She gave him $1.35. Tom spent $\frac{1}{3}$ of the money, or ? cents, for fruit. He spent $\frac{2}{3}$ of the money, or ? cents for other things.

13. After dinner that night, Tom and his father looked at a catalog. They saw a control switch for Tom's electric train for $7.98. Tom's father said, "If you earn the rest, Tom, I'll give you one half of the cost of the switch." Tom's father was offering to pay $? .

14. Before he went to bed, Tom counted the money in his bank. He found he had $\frac{1}{3}$ of the amount that he would need to pay toward the switch (see Problem 13), or $? .

Pages 268 and 269 are to be used after page 51

Using Millions



Tom is studying about the sun and the planets. The picture shows five planets that are nearest to the sun. Tom learned that Mercury is about 43 million miles away from the sun. Venus is about 67 million miles from the sun. The earth is about 93 million miles from the sun. The average distance of Mars from the sun is about 141 million miles. The nearest Jupiter, the largest planet, gets to the sun is about 460 million miles.

1. Copy this table, giving the distances of these five planets from the sun. Write each of the distances out in full, with all the zeros.

Mercury	? miles from the sun
Venus	? miles from the sun
Earth	? miles from the sun
Mars	? miles from the sun
Jupiter	? miles from the sun

2. Which of these planets is about 5 times as far away from the sun as the earth is?

An easy way to add or subtract or multiply or divide with millions like these is to forget about the six zeros in each number and just work with the number of *millions*. So, in this problem, start by multiplying 5×93 (million).

Pages 270 and 271 are to be used after page 63.

3. Which of the planets shown in the picture on page 270 is less than half the distance of the earth from the sun?

4. The average distance of Mars from the sun is how much less than twice the earth's distance from the sun?

5. The earth's distance from the sun is about how many million miles more than Mercury's distance from the sun?

6. Approximately how many miles farther away from the sun is the earth than Venus?

7. Is Jupiter's nearest distance to the sun nearer 3 times or 4 times Mars' average distance from the sun?

8. Pluto is the farthest planet from the sun. The farthest it can get from the sun is 4,300,000,000 miles. How many million miles is this?

9. When Pluto is the nearest it ever gets to the sun, it is still 2,750,000,000 miles away. What is the difference (in millions) between Pluto's farthest and nearest distances from the sun?

10. If a rocket traveled at the speed of light, it would go about 16,070,000,000 miles in 24 hours. How many million miles is this?

11. When the earth and Mars are on the same side of the sun and in line with it, about how many million miles is the earth from Mars? If we had a rocket ship that could go a million miles an hour, how many hours would it take us to go from the earth to Mars?

12. When Jupiter is nearest the earth, it is only about 367 million miles away. Suppose we are traveling in a "slow" rocket that could go only 5 million miles a day. How many days would the trip to Jupiter take?

Pages 270 and 271 are to be used after page 63.

Bob's Hens

Bob earns money by keeping a small flock of hens. He sells eggs and chickens to some of the neighbors and to nearby storekeepers. He pays for feed and other things for his hens. The money that he has left pays him for the work he does in taking care of the hens.

1. Recently Mr. Smith, who runs a grocery store in a small town near Bob's farm, asked Bob whether his hens laid 60 dozen eggs a month. How many eggs are 60 dozen eggs?

2. Bob keeps a record of the number of eggs he gets every day. He had been averaging about 25 eggs a day. At this rate, how many eggs would he get in April? Is this more or less than 60 dozen eggs? How many more or less?

3. Bob agreed to sell most of his eggs to Mr. Smith. One month, he sold 54 dozen eggs to Mr. Smith at an average of 49 cents a dozen. How much did Bob get for his eggs?

Pages 272 and 273 are to be used after page 67.

4. The next month, Bob sold 63 dozen eggs at an average of 47 cents a dozen. How much did he get that month? How much more was this than the month before?

5. Bob has 32 hens in his flock. He says it costs him about 27 cents a month to feed one hen. How much does it cost him a month to feed his flock? About how much does feed cost Bob a year?

6. Bob says that last year he got an average of 25 dozen eggs from each of his hens. He sold the eggs at an average price of 48 cents a dozen. How much money did each hen earn for him? How much money did all 32 hens earn for Bob?

7. About how much does it cost Bob to feed one hen for a year? (See Problem 5.)

8. Bob also raises chickens to sell. Last year he bought 68 baby chicks at 13 cents a chick. How much did he pay for them?

9. Sixty-five of the chicks grew up. Bob sold them at an average of $1.23 apiece. How much did Bob get for them?

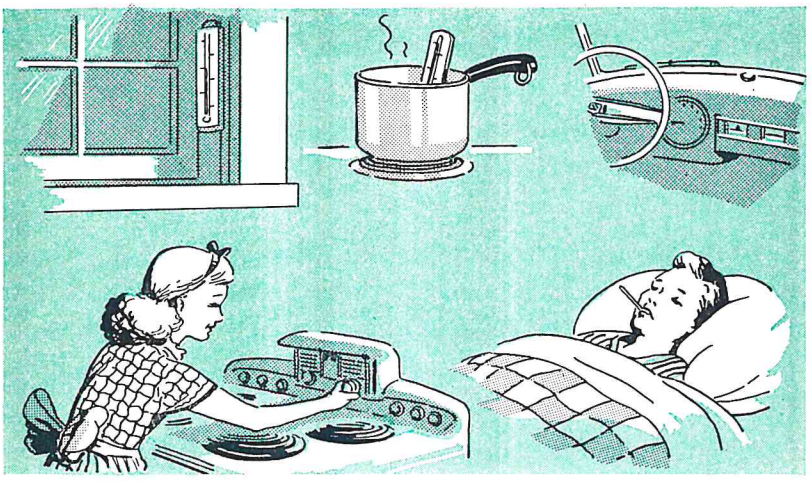
10. Bob figures that it cost him 79¢ apiece to buy and raise these 65 chickens. How much did they cost in all? How much did Bob make on these chickens, after paying his expenses?

11. Bob clears about $25 a month on his egg and chicken business. If he saves half of this, about how much a month does he save? How much does Bob save in a year?

12. Bob wants to increase his flock. He is planning to buy 25 special fancy chicks to raise as hens. These fancy chicks cost 29 cents apiece. How much will he pay for them?

Pages 272 and 273 are to be used after page 67.

Learning About Heat



For thousands of years, people could only guess at how hot or cold it was. Then, about 350 years ago, a scientist named Galileo invented the first **thermometer**, an instrument to measure heat.

A hundred years after Galileo, a man named Fahrenheit invented a thermometer so good we are still using it. Fahrenheit found that a liquid metal called **mercury** gets steadily bigger ("expands") the hotter it gets. Mercury gets steadily smaller ("contracts") as it gets colder.

Fahrenheit put mercury in a thin glass tube with a little bulb at the bottom. He put equal parts of snow and salt around the bulb. The point in the tube to which the mercury sank he called **zero**.

Water **freezes** at **32°** on the **Fahrenheit scale.** Water **boils** at **212°.**

Most of the thermometers we use for everyday tasks are **Fahrenheit.** See if you know what is having its heat measured, and why, in each of the pictures above.

Pages 274 and 275 are to be used after page 73.

1. You have learned that when a temperature is below zero, it is written with a minus sign in front of it. So, $-5°$ means 5 degrees below zero. How many degrees colder is $-27°$ than $27°$?

2. Probably the coldest thing most people ever see is "dry ice." "Dry ice" is $-110°$ Fahrenheit. How many degrees colder than the freezing point of water is dry ice?

3. How much colder than boiling water is "dry ice"?

4. How much hotter than boiling water is an oven at $400°$ Fahrenheit?

5. Mrs. Gray bakes custard at about $275°$ F. (Fahrenheit). She bakes biscuits at about $425°$ F. How much hotter must the oven be for biscuits than for custard?

6. How many degrees colder than freezing is $-18°$ F.?

7. When Don's mother quick-freezes food out of their garden, she does so at a temperature of about $10°$ F. How many degrees below freezing is this?

After she freezes the food, she stores it at $20°$ F. When she wants to use it, she puts it in their regular refrigerator at about $50°$ F. How many degrees above freezing is the regular refrigerator?

Can you see why Don's mother cannot store frozen food in the regular refrigerator? How much colder is the storage refrigerator than the regular one?

8. Bill's father took him to see a steel mill. Bill learned that melted steel is about $3500°$ F. This is how many times as hot as a hot kitchen oven at $500°$ F.? (*Think:* by what number would you multiply 500 to get 3500?)

9. Steel can be rolled into bars when it is about $2100°$ F. This is about how many times as hot as a hot kitchen oven?

Pages 274 and 275 are to be used after page 73.

Camping Out

1. Sam, Don, Bob, Dick, and two other boys went for an overnight camping trip to the lake last summer. They stayed at the lake 18 hours. What fractional part of a day was this? (To find what part of 24 hours 18 hours are, think that 6 hours are one fourth of 24 hours. 18 hours are 3 times 6 hours, so 18 hours are ? fourths of a day.)

2. Bob brought $1\frac{1}{2}$ dozen eggs. How many eggs was this? (Add $\frac{1}{2}$ dozen to 1 dozen.) How many eggs for each boy was this?

3. Sam brought $1\frac{1}{2}$ loaves of sliced bread. The whole loaf had 20 slices in it. How many slices of bread did Sam bring? (Add $\frac{1}{2}$ of 20 to 20.) How many slices apiece did the six boys have?

4. Don brought $1\frac{3}{4}$ dozen ears of corn from his garden. How many ears of corn could each boy have?

5. When they got to the lake, Sam and Bob went fishing. They caught 9 small fish that were big enough to keep. How many fish apiece did the 6 boys have for supper?

Pages 276 and 277 are to be used after page 89.

6. At half past five, Dick and Don started to set up the tent. They finished setting it up at quarter past 6. How many minutes did it take them to set up the tent? What fraction of an hour is this?

7. Two other boys cut wood and built the fire. It took them 40 minutes. What part of an hour is 40 minutes?

8. Two boys started to get supper at 6 o'clock. It took them an hour and a quarter to prepare and cook the food. At what time did they have supper ready to eat?

9. The corn took half an hour to roast. If they started to roast the corn at 6:40, when was it done?

10. The 6 boys had $\frac{3}{4}$ dozen oranges for breakfast. How many oranges apiece was this?

11. The boys slept for $\frac{1}{2}$ of their 18 hours in camp. How many hours did they spend asleep?

12. They spent 2 hours swimming. Was this $\frac{1}{3}$, $\frac{1}{6}$, or $\frac{1}{9}$ of the total time?

13. They spent 3 hours cooking and eating. What fractional part of their camping time was this?

14. At the place the boys camped, the lake is $\frac{3}{8}$ of a mile wide. Sam rowed across the lake and back while he fished. How far did he row?

15. Don's father took the boys and their bicycles 16 miles in his truck. The boys bicycled the other 4 miles to the lake. What part of their trip did the boys do by bicycle?

16. Bob's father and Sam's father camped near the boys. They spent some of the time fishing. Bob's father's biggest fish weighed 6 more ounces than the biggest fish Sam's father caught. What fraction of a pound more was this?

Pages 276 and 277 are to be used after page 89.

Completing Two-Step Problems

1. Allen ordered enlargements of 4 of his best pictures at 35 cents each. He paid for them in advance with a five-dollar bill.

This problem has not been completed. It still needs a question. Finish the problem with a question that will make it a two-step problem and solve the problem by answering your question.

Each of the following problem situations gives you enough information to make a two-step problem. On your paper, write a question that will make each a two-step problem, then work each problem.

2. Sally is going to make an apron for herself. She went to the store with $2.00. She bought some material for 75 cents, a pattern for 15 cents, some ribbon for 18 cents, and buttons for 10 cents.

3. This week, on each of the 5 days from Monday through Friday, Joe practiced on his trumpet for 15 minutes a day. On Saturday, Joe practiced for 30 minutes.

Pages 278 and 279 are to be used after page 109.

4. Last summer, Tony, Bill, and Tom earned money by cutting lawns for their neighbors. One day they got $2.00 for cutting one lawn and $2.50 for cutting another lawn. They shared the money equally.

5. Don picked 24 pounds of tomatoes in his garden one day last summer. He sold them at the family's road stand at the rate of 3 pounds for 20 cents.

6. The 28 children in Barbara's class are each going to try to sell 5 tickets for their school operetta. The tickets are to be sold for 20 cents each.

7. Sue and Jill are making cookies for a 4-H Club party. They want to make 60 cookies in all. They have already made two pans of cookies, with 12 cookies in one pan and 18 cookies in the other pan.

8. The book Nora is reading has 235 pages. Nora has read 75 pages. She can read about 20 pages an hour in this book.

9. Sue made two pans of fudge. There were 32 pieces of fudge in the first pan and 28 pieces in the second pan. Sue put the fudge in boxes with 20 pieces in each box.

10. Tom wants to save half of all the money he earns. He thinks he will be able to earn $3 a week for the next 8 weeks.

11. We have driven 308 miles on a 548-mile trip. We are driving at the rate of 40 miles an hour.

12. Jerry bought a set of 15 French stamps for $1.20. His father said, "I could have bought those stamps for you for 5 cents apiece."

13. In his newest fruit orchard, Don's father has 17 rows of trees with 25 trees in each row. In an older orchard he has 75 trees, and in a third orchard there are 87 trees.

Pages 278 and 279 are to be used after page 109.

Using Averages at School

The pupils in Bill's class wanted to find out in what different ways they used averages in school. They were surprised to see how many times they used averages outside of their regular arithmetic lessons.

1. Tom, Bill, Jack, and Larry are doing some special work in science. Last week, Tom read 40 pages about animals; Bill read 28 pages; Jack read 35 pages; and Larry read 49 pages. On the average, how many pages of reading about animals did each boy do last week?

2. This week, Linda kept track of the time she spent on arithmetic. Monday, she spent 20 minutes; Tuesday, 42 minutes; Wednesday, 15 minutes; Thursday, 28 minutes; Friday, 35 minutes. How many minutes a day, on the average, did she spend on arithmetic?

3. Miss Martin said the arithmetic work was planned to take about half an hour a day, on the average. How near the average did Linda come?

Pages 280 and 281 are to be used after page 111.

4. Last week, the following numbers of pupils in the class were present each day: Monday, 26; Tuesday, 30; Wednesday, 28; Thursday, 29; Friday, 32. What was the *average daily attendance* last week (how many pupils were present each day on the average)?

5. In the whole school, there are 588 pupils in 21 classrooms. There are 32 pupils in one room. That room has how many more pupils than the average number per room?

6. In Miss Martin's room are 65 books which the pupils use for social studies. The average cost of these books was $1.75. What was the total cost of the social studies books?

7. A committee of pupils helps Miss Martin order supplies. The committee wanted to find how many sheets of drawing paper the class used in a week, on the average. For four weeks, they used: 30, 25, 120, and 17 sheets. On the average, how many sheets a week did the class use?

If there are 24 pupils in the class, how many sheets per pupil is this?

8. Last year, there were 31 pupils in Miss Martin's class. They used 279 pencils. On the average, how many pencils per pupil was this?

9. The class wants to know the average distance each pupil lives from school. Two pupils live 1 block away, six live 3 blocks away, eight live 4 blocks away, six live 5 blocks away, and two live 7 blocks away. Can you find, on the average, how many blocks away each of the 24 pupils lives? (*Suggestion:* You first add the total number of blocks. A short cut is to multiply before you add. Instead of adding $1 + 1 + 3 + 3 + 3 + 3 + 3 + 3$, and so on, how can you start?)

Pages 280 and 281 are to be used after page 111.

Tom's Club Uses Records

Tom and eleven of his friends have formed a Good Times Club. The 12 boys earn money and put it in the club treasury. Then the whole club goes on picnics and trips.

Tom is the club treasurer. He keeps careful record of the money. Here is part of Tom's records for April of the money earned by each boy.

Name	1st Week	2nd Week	3rd Week	4th Week
Tom	$ .75	$ .50	$1.15	$ .65
Jack	.58	.64	1.00	.50
Larry	.25	1.00	.75	.70
Jim	.60	.40	.95	1.25
Mike	.80	.50	.50	.95
Jerry	.35	.68	.75	.89
Dave	.47	.90	.75	.75
Bill	.25	.40	.60	.80
Chuck	.50	.80	.60	.75

Pages 282 and 283 are to be used after page 117.

1. Joe, Tony, and Hank aren't on the part of the record shown on page 282. Joe contributed 35¢, 75¢, 30¢, and 90¢. What was his total contribution in April?

2. Tony put 50 cents a week into the club. How much did he contribute in April?

3. Hank's contributions were 60¢, 49¢, 35¢, and 50¢. How much did he contribute?

4. On your paper, list the name of each of the 12 boys. Beside it, write his total contributions for April.

5. Early in May, the club decided to take a trip to visit some caves. The total cost of the trip was $37.20. How much per boy was this?

6. Make another column on your paper. Head it "Amount Needed." In it write the amount of extra money each of the 12 boys had to bring for the trip. Your record will start like this:

Name	Total Contribution	Amount Needed
Tom	$3.05	$ .05

7. Sometimes the club earns extra money as a group. In December, the boys earned $8.50. In January, they made $8.52. In February, they made $9.60. In March, they made $9.50.

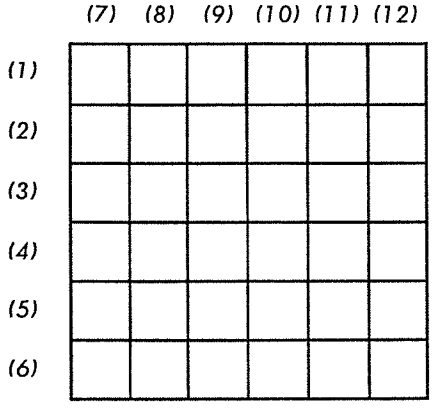
Make a record of these group earnings and find the total.

8. How much money per boy was earned in the 3 months?

9. For their last trip of the year, the boys want to take a steamboat excursion. The cost will be $3.65 per boy. If the club uses the money they made (Problem 7), how much extra money will each boy need for the trip?

Pages 282 and 283 are to be used after page 117.

Two Number Puzzles



1. This puzzle is a sort of magic square. On your paper, copy the square at the left. Work the addition examples below marked *Across* and write the sums *across* your square. If your work is correct, (7) *down* will be the same as (1) *across*, (8) *down* will be the same as (2) *across*, and so on. If all the *down* answers do not check the *across* answers in this way, do your work over to find your mistake.

Across

(1) 41603 + 82109 + 37687
(2) 84321 + 5039 + 526623
(3) 65584 + 72996 + 20744
(4) 95646 + 189821 + 108135
(5) 342651 + 609224 + 30194
(6) 17662 + 901784 + 14849

2. Copy the square again and fill it in with the products of the examples below in the same way. The *down* answers should check the *across* answers, just as in the first puzzle.

Across

(1) 424 × 382
(2) 927 × 743
(3) 305 × 612
(4) 1047 × 933
(5) 828 × 805
(6) 8101 × 100

Page 284 is to be used after page 132.

Can You Write the Right Question?

Each problem situation on this page has all the information you need to make a problem with two or more steps. Can you write the final question for each problem on your paper? Then solve the problem and write the answer on your paper. Each answer should be a *number.*

1. Peggy went to the store with the five dollars she got for Christmas. She bought some skating socks for 69 cents and a sweater for $3.50.

2. Jerry is trying to decide which of two sets of stamps to buy. He can get a set of 15 French stamps for 8 cents apiece, or a set of 10 Dutch stamps for 10 cents apiece.

3. Dick is going to build some shelves for his mother. There will be 3 shelves, each 3 feet long. The two end pieces, of the same kind of lumber, are each 4 feet long.

4. Linda is 4 feet 9 inches tall. Sylvia is 5 feet tall.

5. Sally bought 8 cupcakes costing 6 cents each and a loaf of bread costing 19 cents. She gave the clerk one dollar.

6. We can drive to Elwood by way of Charlotte. From where we are to Charlotte is 39 miles, and from Charlotte to Elwood is 27 miles. Or we can go to Elwood by way of Ironton—46 miles to Ironton, 17 miles from Ironton to Elwood.

7. Bob's class is planning a trip to the city. If the 26 pupils go by train, their round trip fare will be $1.54 per pupil. Or the class can have a school bus take them for a total of $27.75.

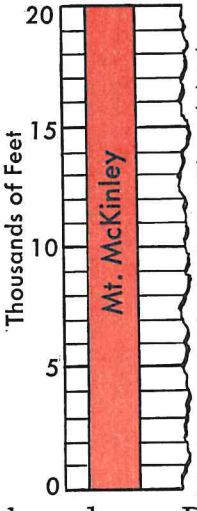
8. Jack's father has a truck that can haul a load of 5 tons. Recently he hauled 9720 lb. of gravel in his truck.

Page 285 is to be used after page 139.

Make Your Own Graph

Suppose you are giving a report to your class on some famous mountains in North America. In a *World Almanac,* or an encyclopedia, or a geography, you find facts about the heights of these mountains and make the following table.

Mountain	Height in Feet	Height to Nearest 1000 Ft.	Thousands of Feet
Mt. McKinley, Alaska	20,300 ft.	20,000 ft.	20
Popocatepetl, Mex.	17,887 ft.	18,000 ft.	18
Mt. Whitney, Calif.	14,495 ft.	14,000 ft.	14
Mt. Rainier, Wash.	14,408 ft.	14,000 ft.	14
Mt. Hood, Ore.	11,245 ft.	11,000 ft.	11
Mt. Washington, N.H.	6,288 ft.	6,000 ft.	6



You want to turn your table into a simple bar graph, so that the class can "see" how the heights of the different mountains compare.

In your table, you have changed the numbers in the first column into numbers that are easier to understand and compare. The second column shows the height of each mountain to the nearest thousand feet, and the third column shows how many thousands there are in each number.

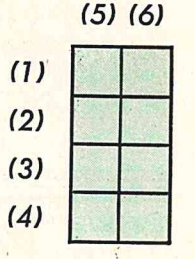
1. Use the numbers in the third column for your graph. The graph has been started for you at the left. The bar for Mt. McKinley has been drawn. Draw the bars for the other mountains. Under each bar, write the name of the mountain.

2. Mt. McKinley is about how many times as high as Mt. Washington?

Page 286 is to be used after page 141.

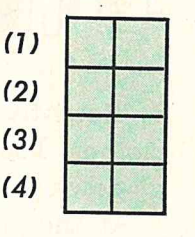
Three Number Puzzles

1. On your paper, copy the rectangle at the right. Work the four following division examples marked *Across* and write the quotients across your rectangle. Then do the multiplication examples marked *Down*. If your work is correct, your answers *down* will check your answers *across*.



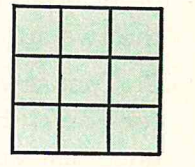
Across		Down	
(1) $2170 \div 62$	(3) $952 \div 14$	(5) 45×77	
(2) $3480 \div 87$	(4) $928 \div 16$	(6) 53×96	

2. Copy the rectangle at the right. For the answers *across*, write the remainders of the following division examples. For the answers *down* write the remainders of the two subtraction examples. If your answers *down* don't check your answers *across*, find out where you made your mistake.



Across		Down	
(1) $4403 \div 93$	(3) $8158 \div 17$	(5) $9009 - 5697$	
(2) $8103 \div 39$	(4) $2429 \div 48$	(6) $6741 - 4682$	

3. Copy the square at the right. For the answers across, write the quotients of the three division examples below marked *Across*. Check by finding the quotients of the three examples marked *Down*.



Across: (1) $9936 \div 27$ (2) $12122 \div 58$ (3) $41949 \div 79$
Down: (4) $21450 \div 66$ (5) $28944 \div 48$ (6) $11583 \div 13$

Page 287 is to be used after page 145.

Buying Clothes for Tom

1. Recently Tom's mother said, "Tom, you need some new clothes. I saw a sale advertised in the paper tonight. We'll go down to the store tomorrow and see what we can find."

At the store, Tom and his mother found a corduroy jacket. The price tag said $8.95. The jacket was slightly soiled and was marked "$\frac{1}{5}$ off." How much did Tom's mother pay for the jacket?

2. They looked at two suits. One was priced $22.50. The other was $18.98. What was the difference in price between the two suits?

3. Tom saw some plaid shirts marked $1.69 apiece, or two for $3.27. How much did he save by buying two shirts at once instead of at different times?

4. Tom's mother saw a sweater for $2.78, and another for twice as much. How expensive was the second sweater?

Pages 288 and 289 are to be used after page 149.

Clothes for the Family

1. Ann and her mother went shopping for clothes. Ann's mother bought herself a pair of shoes for $15. Ann's shoes cost $9.78. How much less did Ann's shoes cost than her mother's?

2. Sue and her mother looked at goods for a dress for Sue. One piece cost 89 cents a yard and another one cost $1.10 a yard. How much more would a dress of the $1.10-a-yard material cost, if it takes 4 yards to make Sue a dress?

(Choose the easier way to do this problem.)

3. Sue bought 3 pairs of socks for $1.00 instead of 3 pairs for 39 cents a pair. How much did she save?

4. A store had some winter coats on sale in the spring, for $\frac{1}{3}$ off. How much would Mrs. Lane save by buying Jean a $24.42 coat at this sale? How much would the coat cost?

5. On a sale, Jean's mother bought Jean two blouses at half price. One blouse had been $1.98 and the other had been $1.70. What did Jean's mother pay for both?

6. Mr. Lane looked at two overcoats. One was priced at $29.50. Mr. Lane thought he could wear this coat two years. The other coat cost twice as much, but Mr. Lane thought he could wear it for 5 years.

a. How much did the second coat cost?

b. How much per year would the first coat cost? (Why should you divide by 2?)

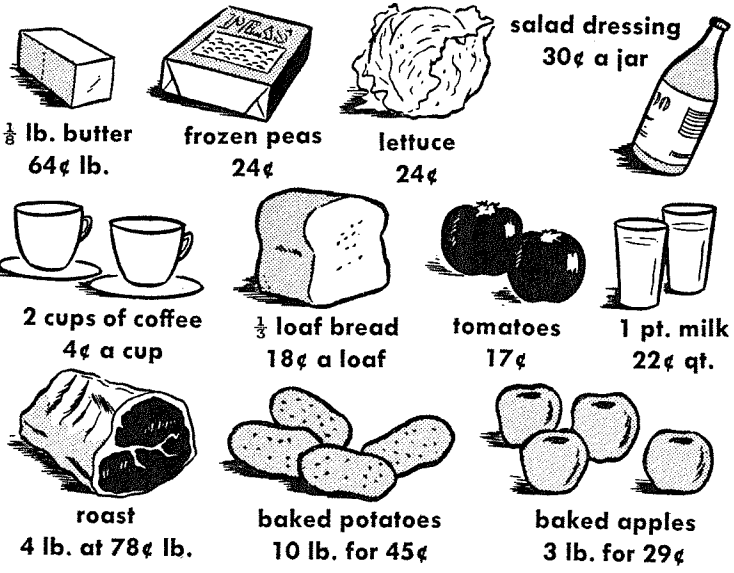
c. How much per year would the second coat cost?

d. How much *less per year* would the more expensive coat cost?

e. Which coat do you think Mr. Lane should buy? Why might he buy the other coat?

Pages 288 and 289 are to be used after page 149.

How Much Does a Meal Cost?



One evening, the Lanes had a dinner that tasted especially good. Mr. Lane said, "I wonder how much this dinner cost us."

"I know how much I paid for the food," Mrs. Lane said. "If Tony and Jean will help, maybe we can count everything up."

All the Lanes got paper and pencils and started to figure. They used the prices shown in the picture above.

1. What was the total cost of the 4-pound roast? Mrs. Lane thought they ate about $\frac{1}{3}$ of the roast for dinner. What was the cost of the meat they ate?

2. Mrs. Lane cooked 2 pounds of the potatoes she bought. How much did the potatoes for dinner cost?

Pages 290 and 291 are to be used after page 155.

3. The family ate about $\frac{1}{8}$ pound of butter, and about $\frac{1}{3}$ of a loaf of bread. Find the total cost of the bread and butter they ate.

4. For the salad, Mrs. Lane used half of the head of lettuce, both the tomatoes, and about $\frac{1}{5}$ of the jar of salad dressing. How much did the salad cost?

5. Mrs. Lane used about one pound of apples for baked apples for dessert. What was the cost of the apples she used? (In your answer, count the fraction of a cent as another cent.)

6. Tony and Jean together drank 1 pint of milk. What was the cost of the milk they drank?

7. Mr. and Mrs. Lane each had a cup of coffee at 4 cents a cup. The sugar and cream for the coffee and baked apples she thought cost about 14 cents. How much were these items in all?

8. Find the total cost of the dinner. On your paper make a table to show the cost of these items.

(a) Meat

(b) Potatoes and peas

(c) Salad

(d) Bread and butter

(e) Dessert, beverages, cream and sugar

9. If each of the 4 Lanes ate about the same amount, how much did each person's dinner cost?

10. See if you can find how much the Lane's dinner would cost at present prices. Find what the prices are now by looking in a store, reading advertisements, or asking your mother.

Pages 290 and 291 are to be used after page 155.

Choosing the Right Question

1. Jerry bought 4 stamp packets costing 49 cents each and another packet costing 75 cents.

See if you can write a question that will make this a two-step problem. Make your question an addition one. The first step in the problem is to find out how much all four 49-cent stamp packets cost.

On your paper, write "**1.** $\times$ $+$" and your question. Then work the problem and write your answer after your question.

Do the rest of these problems in the same way. Number your paper 1 to 10. After each number, write the signs that will show which two processes you use in solving the problem. Then write your question and your answer.

2. Twenty pupils from Jill's school are planning to go to the city on Saturday to see the zoo. They can hire a bus to take them for $25. If they go by train, the round-trip ticket for each pupil will cost $1.85. (Your question should make the *second* step subtraction.)

Pages 292 and 293 are to be used after page 173.

3. Sam bought a used bicycle for $9.50. He spent $3.69 for paint and parts to fix it up, and sold it for $16. (Make the second process subtraction.)

4. This week, Nancy practiced on the piano 45 minutes on Monday, 38 minutes on Tuesday, 25 minutes on Wednesday, 42 minutes on Friday, and 60 minutes on Saturday. (The second process should be division.)

5. Mrs. Lane bought 6 new breakfast plates costing 69 cents a plate. She gave the clerk a $5 bill. (The second process should be subtraction.)

6. At the start of an automobile trip, the Lanes' speedometer read 9,846 miles. At the end of the trip, it read 10,454 miles. The Lanes used 32 gallons of gasoline on the trip. (Make the second process division.)

7. Last year, Bob got an average of 725 eggs a month from his hens. This year he is averaging 754 eggs a month. (The second process should be multiplication.)

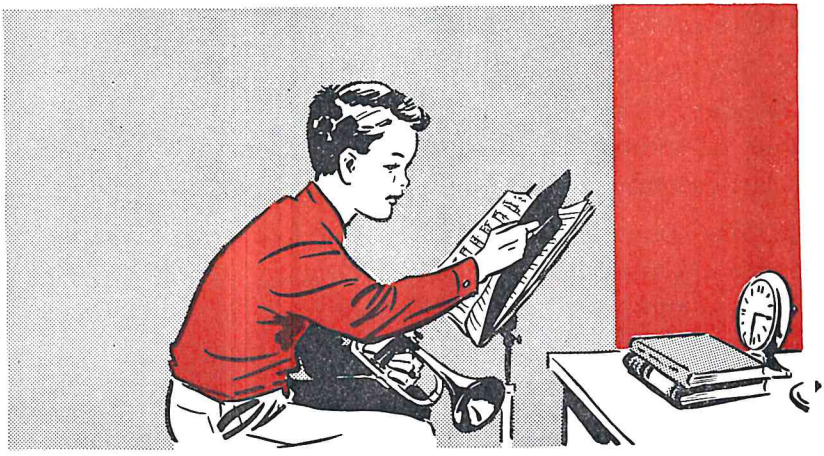
8. Mrs. Lane is planning to spend $35 for Jean's clothes this spring. She has bought a pair of shoes costing $7.95 and a spring coat costing $17.80. (Make the second process subtraction.)

9. Last summer, Bill and some of his friends went on a 4-day mountain trip with a guide. The guide charged $30 a day for the trip. The 6 boys shared the cost equally. (Make the second process division.)

10. Alma is buying Christmas presents for her family. She has spent $1.50 for a present for her father, the same amount for a present for her mother, and $1.20 for a present for her brother. (The second process should be division.)

Pages 292 and 293 are to be used after page 173.

Can You Estimate?



1. Joe wants to practice on his trumpet 4 hours this week. After school on Monday, he practiced 32 minutes, on Tuesday 35 minutes, and on Wednesday 28 minutes. About how much longer must he practice?

In this problem, the easy way to estimate the answer is to think of 32 minutes, 35 minutes, and 28 minutes as about $\frac{1}{2}$ hour each. Add $\frac{1}{2} + \frac{1}{2} + \frac{1}{2}$, and subtract from 4.

2. Bob is getting an average of 25 eggs a month from each of his 29 hens. About how many dozen eggs a month does he get?

Here you estimate that 25 eggs are about 2 dozen and 29 hens about 30.

For each of the following quickies, write on your paper the number of the problem, then the round numbers you use in the problem, then your estimated answer. You don't have to find the exact answer.

3. I have $1.98 in my pocket and want to buy a pencil costing 49 cents. About how much will I have left?

Pages 294 and 295 are to be used after page 185.

4. Tom earned $1.87 week before last, $3.07 last week, and $1.15 this week. About how much did he earn a week, on the average?

5. Shirts are on sale at a special price of $1.95 each. How much will four of these shirts cost Mr. Lane?

6. There are 288 pages in Nora's book and she has read 98 of them. About what fractional part of the book has she read?

7. How much will Mr. Lane have left from a $20 bill if he buys two railroad tickets costing $4.91 each?

8. Bob was born April 29. His cousin Chuck was born in the same year, but his birthday is October 30. About how many months younger is Chuck than Bob? (Think of April 29 as about May 1 and Oct. 30 as about November 1.)

9. Our city has 387,632 people in it. The next largest city in the state has a population of 101,598. About how many times as large is the city we live in? (Round each number to the nearest 100,000.)

10. The earth is about 93 million miles away from the sun. When Saturn is 905 million miles from the sun, it is how many times as far from the sun as we are?

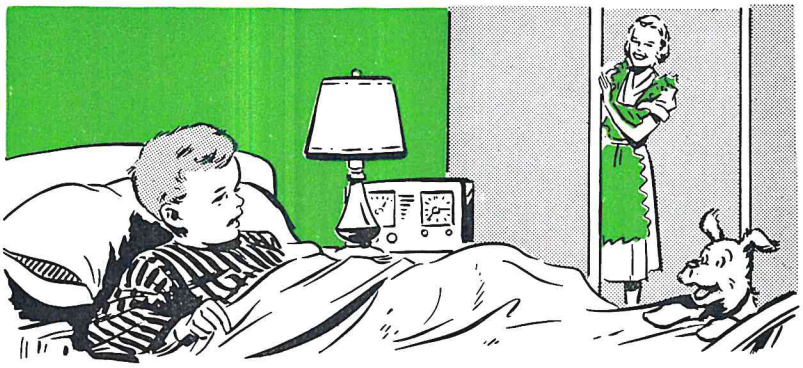
11. Ellen has a new dress that cost $7.89 and a new hat that cost $3.95. She paid $5.98 for some new shoes. About how much did Ellen's new outfit cost?

12. The Empire State Building in New York City is 1,250 ft. high. It is about how many times as tall as our city hall, which is 96 ft. high?

13. Sally is helping to make costumes for a play. One takes 35 inches of trimming, another takes 48 inches, and a third takes only 20 inches. About how many feet of trimming will Sally need?

Pages 294 and 295 are to be used after page 185.

Using Fractions Every Day



Just for fun one day, Jerry kept track of all the ways he could use fractions that day. See if you use fractions in some of these ways. Do you use fractions in any other ways?

1. "Get up, Jerry. You have half an hour to dress and eat breakfast before you start for school." How many minutes did Jerry have?

2. When Jerry's mother called him, it was quarter past 8. At what time must Jerry start for school?

3. In Jerry's city, 12 blocks make 1 mile. Jerry lives 4 blocks from school. What part of a mile does he live from school?

4. Some days Jerry comes home from lunch. If he walks both ways, how many miles does he walk to and from school on a day when he comes home for lunch?

5. There are 28 pupils in Jerry's class at school. This morning, four pupils were absent. What fraction of the class was absent this morning? What fraction was present?

6. In the afternoon, only 2 pupils were absent. What fraction of the class was present in the afternoon?

Pages 296 and 297 are to be used after page 195.

7. In social studies, the class was studying houses. Jerry helped build a model of a house. From a piece of cardboard $\frac{3}{4}$ of a foot long, he cut a piece $\frac{1}{2}$ foot long. What part of a foot was left? How many *inches* were left?

8. Miss White said, "Jerry, will you order the crackers for our milk this morning? Half the class wants plain crackers and $\frac{3}{8}$ of the class wants graham crackers."

a. If 24 pupils were present, how many envelopes of plain crackers should Jerry order?

b. How many envelopes of graham crackers should Jerry order? (How much is $\frac{1}{8}$ of 24? Then how much is $\frac{3}{8}$ of 24?)

c. What fraction of the class ordered crackers? What fraction did not order crackers? How many pupils did not order crackers?

9. After school, Jerry went to the store for his mother. He bought $\frac{1}{4}$ pound of butter at 76 cents a pound, $\frac{1}{2}$ pound of meat for the cat at 32 cents a pound, and $\frac{1}{8}$ pound of dried beef at $1.60 a pound. How much did Jerry pay for all three things? How heavy a package did he carry home?

10. Jerry also mailed 3 little packages for his mother. One weighed $\frac{1}{2}$ pound and two weighed $\frac{1}{8}$ pound apiece.

a. What fraction of a pound did all three packages weigh?

b. How many *ounces* did all three packages weigh?

c. If Jerry mailed all the packages first class, at 3 cents an ounce, how much postage did he have to pay?

11. After dinner, Jerry and his father looked at their stamp albums. One third of Jerry's collection is American stamps and $\frac{1}{6}$ is Canadian stamps. What part of his collection are the American and Canadian stamps together?

Pages 296 and 297 are to be used after page 195.

A Number Trick

Here is a magic number trick you could use at a party. Say, "Choose any number you like and multiply it by 6. Add 12. Divide by 2. Now subtract 6 and tell me your answer. I'll tell you the number you started with."

Here's the magic. You can always get the original number by dividing the answer by 3!

A good magician always tries out his magic first to be sure it works. Let's try the number 29.

1. Multiply 29 by 6. What is the product?

2. Add 12. What is the sum?

3. Divide by 2. What is the quotient?

4. Subtract 6. What is the remainder?

5. Now divide your remainder by 3. Is the quotient 29? If it isn't 29, there is some mistake in your arithmetic.

Try out this trick with 4 numbers of your own choice. Pick out some large numbers and some small numbers. See if you always get the answer you are supposed to get. If you don't, find out where you made your mistake.

Pages 298 and 299 are to be used after page 203.

Two More Number Tricks

Here are two more number tricks which you can use.

Trick 1. Say, "Write any number you please. Multiply it by 2. Add 18. Divide by 2. Now subtract the number you began with, and I'll tell you the answer."

The answer will always be 9!

Let's try the trick with the number 37.

1. Multiply 37 by 2. What is the product?
2. Add 18. What is the sum?
3. Divide by 2. What is the quotient?
4. Subtract 37, the number you started with. Is your answer 9? If not, find where you made your mistake.

Pick out 3 other numbers and see if the trick works with them. Try numbers that differ a great deal in size.

Trick 2. Say, "Take any number you want. Multiply it by 3. Add 15. Divide the sum by 3. Subtract the number you started with." The answer will always be 5.

See if this trick works with the number 19.

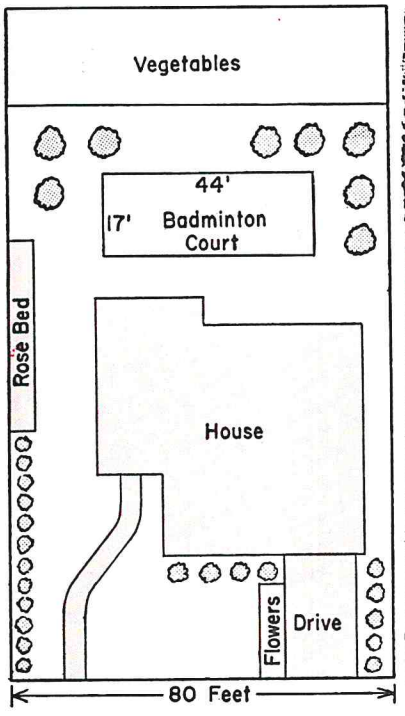
1. Multiply 19 by 3. What is the product?
2. Add 15. What is the sum?
3. Divide by 3. What is the quotient?
4. Subtract 19, the number you started with. Is your answer 5? If not, find where you made your mistake.

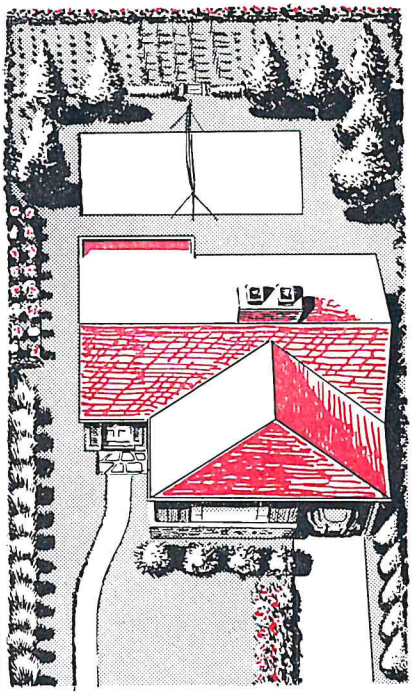
Pick out 3 other numbers and try the trick with them.

See if you can find out why these tricks work. If you can find out, you will be able to make up another trick like them. It might be as simple as, "Multiply by 4, divide by 4, add 7, subtract the original number." What will the answer always be?

Pages 298 and 299 are to be used after page 203.

The Lanes Buy a House





1. The Lanes have just bought a new house. Above is a scale drawing of the lot their new house stands on. The lot is 80 feet wide. Measure the width of the drawing. How many inches wide is it? Then how many feet does each inch stand for? What is the scale of the drawing?

2. On this scale:

a. A line $\frac{1}{4}$ inch long stands for ? feet.
b. A line $\frac{1}{8}$ inch long represents ? feet.
c. A line $\frac{3}{8}$ inch long equals ? feet.
a. A line $1\frac{3}{4}$ inches long equals ? feet.

Pages 300 and 301 are to be used after page 215.

3. From the drawing on page 300, find how many feet *deep* the Lanes' lot is, that is, how many feet it goes back from the front line. First, measure the drawing the long way. How many inches long is it? So how many feet deep is the lot?

4. Measure the vegetable garden at the rear of the lot. How many inches long is it? What fraction of an inch wide? The vegetable garden will be ? feet wide by ? feet long.

5. Mr. Lane is planning to put a high fence around the vegetable garden to keep the dogs out. How many feet of fence will he need to go around the garden?

6. Tony and Jean are helping their father lay out the badminton court with some string. The court is to be 44 feet long and 17 feet wide. How much string will they need to go around all four sides? How many yards of string is this?

7. To the nearest eighth of an inch, the house is $1\frac{3}{8}$ inches long. About how many feet long is the house?

8. Mrs. Lane wants a rose garden. Measure the rose bed at the left of the drawing. It is ? inch long and ? inch wide. Then how many feet long is the rose garden to be? How many feet wide?

9. Mrs. Lane also wants a small flower bed along the drive. Measure the flower bed shown in the drawing. How many feet wide will the flower garden be? How many feet long? How many feet shorter than the rose bed will the flower bed be?

10. Measure to the nearest eighth of an inch the length of the drive from the front line of the lot to the house. What fraction of an inch is the length? Then how many feet long is the drive?

Pages 300 and 301 are to be used after page 215.

A Trip to the Museum

We go to school in a small town. Next Saturday, pupils from two classes will make a trip to the city to visit the museum. We want to see how the first white people in this country lived. We want to see models of the old stage-coaches and boats.

We are planning the trip ourselves. Here are some of our problems in connection with the trip.

1. Ten pupils from Miss Scott's room and 14 pupils from Miss Lang's room are going, and so are the two teachers. Our bus costs $15 for the trip and $7.50 for the driver. How much apiece will we have to pay? (What do you do with the fraction of a cent that is left over?)

2. One of our problems is food. The school cafeteria will make us a box lunch with 2 sandwiches at 10 cents apiece, an apple for 5 cents, cookies for 4 cents, and milk for 6 cents. Or we can have a box lunch with one sandwich at 10 cents, some cake for 6 cents, milk for 6 cents, and a banana for 7 cents. How much less expensive is the second lunch?

Pages 302 and 303 are to be used after page 223.

3. Ten boys choose the lunch with the 2 sandwiches. The rest of the pupils and the teachers choose the one-sandwich lunch. How much will all our lunches cost together?

4. The trip to the city takes an hour each way. We are planning another hour for stops and for lunch at a roadside park. We want to spend 2 hours at the museum. To get back at 4 o'clock, when must we start for the city?

5. At the museum, we will first see a movie on early American life. The movie takes three quarters of an hour. Then we divide into small groups and spend 20 minutes at each of 3 exhibits. How much of our museum time will the movie and exhibits take?

6. We are getting ready for the trip through study and reports. In the next 6 school days, 3 pupils will make reports each day on the things we are going to see. If each report takes 5 minutes, how many hours of reports will there be?

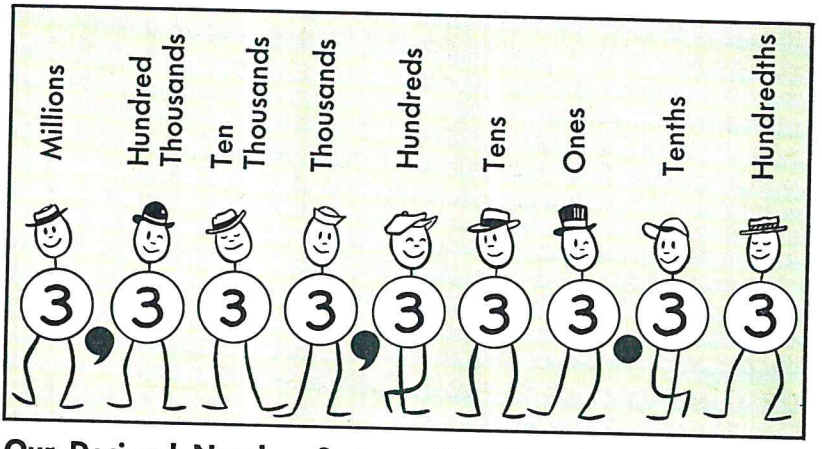
7. It is about 90 miles from New York to Philadelphia. In Colonial times, it often took a man 30 hours on horseback to make this trip. Now, a fast train can make this trip in an hour. The train travels how many times as fast as the horse did?

8. It is about 220 miles from New York to Boston. Suppose a train made the trip at an average speed of 44 miles an hour. How many hours less would the train take for the trip than an old stagecoach averaging 7 miles an hour?

9. It took the *Mayflower* 63 days to cross the Atlantic Ocean. A modern ocean liner can make the trip in 5 days. How many *round trips* could a modern liner make while the *Mayflower* made her famous trip?

Pages 302 and 303 are to be used after page 223.

What Is the Decimal System?



Our Decimal Number System, Showing Place Value in a Number Table

The picture above shows the part of our number system that is used the most. The number system itself extends in both directions indefinitely. There is no end to it. There is no number so large you can't think of a larger one. There is no number so small you can't write a smaller one.

Men who study the stars need far bigger numbers than any on this page. Men who study atoms need numbers far smaller than the picture shows. But they can easily write these numbers, because of the way our number system is made.

Our number system is called the **decimal system,** because it is built on **tens.** See if you can find out how it is put together.

1. How many times as large as 3 is 30? In the number 33, how many tens are there? How many ones? How many places to the *left* of the 3 ones are the 3 tens written?

Pages 304-307 are to be used after page 237.

2. How many times as large as 30 is 300? In the number 333, how many hundreds are there? How many tens? How many places to the *left* of the 3 tens are the 3 hundreds written?

$10 \times 3 = 30$
$10 \times 30 = 300$
$10 \times 300 = 3{,}000$
$10 \times 3{,}000 = 30{,}000$
$10 \times 30{,}000 = 300{,}000$
$10 \times 300{,}000 = 3{,}000{,}000$

3. Look at the table above. In what direction does the 3 move each time you multiply by 10? How many places does it move each time?

In our number system, a number directly to the **left** of another number has a *place value* **ten times** as large as the *place value* of the other number.

4. Now move *right* in the number table. 30 is what fraction of 300? 3 is what fraction of 30?

5. You know that .3 means $\frac{3}{10}$. You know that .03 means $\frac{3}{100}$. If *one hundredth* is $\frac{1}{10}$ as large as *one tenth*, $\frac{3}{100}$ equals what fraction of $\frac{3}{10}$?

In our number system, a number directly to the **right** of another number has a *place value* only **one tenth** as large as the *place value* of the other number.

6. Write the number that is 10 times as large as .6. Write the decimal number 10 times as large as .09.

7. Write the decimal number one tenth as large as 4. Write the number that is one tenth as large as .2.

Pages 304-307 are to be used after page 237.

Using Decimals

Decimals are easy to use because they are built right into our number system. You can add and subtract them just as you can any other numbers. You have already multiplied and divided decimals when you multiplied and divided money numbers.

Decimals are often handier than fractions. In the problems below, change each fraction to a decimal before you work a problem.

Subtract
$2\frac{1}{2} = 2.50$
$1\frac{3}{4} = 1.75$
$.75$

1. Dan lives $1\frac{3}{4}$ miles from town. Along the same road but farther from town, Ken lives $2\frac{1}{2}$ miles from town. How far is it from Dan's house to Ken's house? (Change each fraction to a decimal before you subtract.)

2. Don sometimes works for his father. Last week, after school, he helped in the orchard $\frac{1}{2}$ hr., $\frac{3}{4}$ hr., $1\frac{1}{4}$ hr., 1 hr., and $1\frac{1}{2}$ hr. How many hours did Don work in all? If Don gets 35 cents an hour for this work, how much did he earn last week?

3. It is $5\frac{1}{2}$ miles from Alford to Quinby, $13\frac{3}{10}$ miles from Quinby to Belltown, $19\frac{1}{5}$ miles from Belltown to Pauling, and $8\frac{9}{10}$ miles from Pauling to Fuller. If Mr. Lane drives from Alford to Fuller by this route, how many miles will he go?

4. Bob sold 5 chickens weighing $4\frac{1}{2}$ lb., $3\frac{1}{4}$ lb., $3\frac{3}{4}$ lb., $5\frac{1}{2}$ lb., and $5\frac{1}{4}$ lb. Bob got 40 cents a pound for the chickens. How much did he get in all? (Change the decimal in the total number of pounds to a fraction before you multiply.)

Pages 304-307 are to be used after page 237.

5. Sally and Jean are helping with costumes for a play. Five costumes will take the following yards of material: $3\frac{1}{2}$, $4\frac{1}{4}$, $4\frac{1}{4}$, $3\frac{3}{4}$, and $3\frac{3}{4}$. How many yards of material must the girls buy in all? If they can get material for 32 cents a yard, how much will their costumes cost? (Change the decimal in the total number of yards to a fraction before you multiply.)

6. Tom fixed a bucket with a gauge to measure rainfall for the weather study his class is making. Tom thinks that in March, $3\frac{1}{4}$ in. of rain fell, in April, about $2\frac{3}{4}$ in. fell, and in May, about $2\frac{1}{2}$ in. fell. What was the total rainfall for these three months? The Weather Bureau figures for these three months were 3.37, 2.93, and 2.39. For each of the three months and for the total, how many hundredths of an inch off was Tom's homemade gauge?

Is This a Magic Square?

In a magic square, the numbers add up to the same sum, no matter in what direction you add them. You can add *across* each row, or you can add *down* each column, or you can add *from corner to corner.*

2.4	.3	1.8
.9	1.5	2.1
1.2	2.7	.6

Add the numbers in this square to see whether it is a magic square.

1. What is the sum of the three numbers in each row?

2. What is the sum of each of the three columns?

3. What is each sum of the three numbers from corner to corner?

Is this a magic square?

Pages 304-307 are to be used after page 237.

Can You Finish These Problems?

1. Sam decided to sell all his rabbits. He sold 8 big rabbits for $1.65 apiece, 14 little rabbits for 75 cents apiece, and a pair of fancy rabbits for $5.00.

See if you can write a question that will make this a three-step problem. What processes will you use to solve your problem? Will you use one process more than once?

Write a question to make each of the following a 3-step problem.

2. Sally's mother gave her a $5 bill and asked her to go to the grocery. At the store Sally bought 3 cans of peaches at 35¢ a can, some bananas for 42¢, and some meat for 98¢.

3. The Lanes started on a two-day automobile trip of 567 miles. When they left home, the speedometer read 10,982.6. At the end of the first day, it read 11,239.3.

4. Today, from 8 a.m. to 12 noon, the temperature rose from 48° to 72°. Yesterday, during these same four hours, the temperature rose from 43° to 62°.

5. Last week, Don worked $1\frac{1}{4}$, $1\frac{1}{2}$, and $\frac{3}{4}$ hours. His father paid him 40¢ an hour. His father also paid Don the $2.40 he had earned by working the week before.

Pages 308 and 309 are to be used after page 248.

Some More Old Problems

Here are some more so-called "Practical Problems" from an old arithmetic book. Can you work them?

1. Emma bought 475 pins; her mother gave her 389, and her sister gave her enough to make her number 1000. How many pins did she receive from her sister?

2. I bought 78 oxen at 68 dollars each, and 317 sheep at 12 dollars each. How much did all the animals cost?

3. A man bought 246 cows at 24 dollars each, and sold them for 32 dollars each. How much did he gain by the transaction?

4. William had 436 dollars; his father gave him 2458 dollars. He then lost 1879 dollars, and gave away 296 dollars. How many dollars had he then?

5. Walton travels 27 miles a day, and Thomas travels 51 miles a day. How much farther does Thomas travel in 76 days than Walton?

6. A farmer had 399 pigs and bought 83 pigs, and then sold 183 pigs. How many had he then?

7. A drover sold his cows for 2625 dollars, and his sheep for 986 dollars, and gained 587 dollars. How much did he pay for the cows and sheep?

8. If the President of the United States expends 103 dollars daily, how much can he save in a year of 365 days, out of his salary of 50000 dollars?

9. If 29 men earn 7946 cents in a day, and 25 boys earn 5450 cents in a day, how much more does one man earn in a day than one boy?

Pages 308 and 309 are to be used after page 248.

Planning Our Family Vacation

1. Our family is planning to take a four-week vacation this summer. We are going to spend half the time at a cottage on a lake. How many days shall we spend at the cottage?

2. It is a 234-mile drive to the cottage. Father thinks we can average about 36 miles an hour. How many hours will the trip to the cottage take us? If we start from home at six o'clock in the morning, and stop an hour for lunch, when should we reach the cottage?

3. We plan to rent a boat so we can take picnic trips around the lake. Father thinks a good time to start on a picnic trip would be 10:30 a.m. and a good time to get back from a trip would be 4:30 p.m. How many hours would a picnic trip take?

4. Our cabin rents for $35 a week. The boat will cost $5 a week. The drive to the lake and back home will cost about $12 each way. Mother thinks it will cost about $28 a week for food. How much will our two weeks at the lake cost in all? There are four in our family. How much per person will the cost be?

Pages 310 and 311 are to be used after page 249.

5. For the other two weeks of our vacation, we are going on a 2000-mile automobile trip. If our car averages 17 miles to a gallon of gasoline, how many gallons of gasoline shall we need? (Figure to the nearest gallon.)

6. Father thinks our gasoline will average 25 cents a gallon. He expects to change the oil once, buying 5 quarts at 40 cents a quart. How much should the gasoline and oil for our trip cost us?

7. Father is planning on $2.80 a day per person for food. How much should food cost us on this 2-week trip?

8. We expect to pay an average of $2 per person for staying overnight. If we are on the road for 9 nights, how much will we pay in all for the overnight stops?

9. We are planning to stay at Grandfather's house for 4 days. If we drove 5 hours a day for the rest of the two weeks, how many miles an hour would we have to average for the 2000-mile trip?

10. Father says we can each take just 25 pounds of baggage on the long trip. My clothes weigh 18 pounds, some hiking boots weigh $3\frac{1}{4}$ pounds, my camera weighs $\frac{3}{4}$ pound, and my raincoat weighs $2\frac{1}{4}$ pounds. How many more pounds of baggage can I take?

11. Father will give each of us $5 to spend for souvenirs, postcards, and so on. If I spend half of my $5 for an Indian belt with silver trimmings, and $2 of it for other souvenirs, how many 2-for-a-nickel postcards can I buy with the rest?

12. Our four-week vacation will start on July 13. On what date will it be over? (There are several ways to do this problem. Can you solve it without using a calendar?)

Pages 310 and 311 are to be used after page 249.

Tables of Measures

Measures of Length

12 inches (in.) = 1 foot (ft.)
3 feet (ft.) = 1 yard (yd.)
1760 yards (yd.) = 1 mile (mi.)

Measures of Time

60 seconds (sec.) = 1 minute (min.)
60 minutes (min.) = 1 hour (hr.)
24 hours (hr.) = 1 day (da.)
7 days (da.) = 1 week (wk.)
12 months (mo.) = 1 year (yr.)
365 days = 1 year
366 days = 1 leap year

Thirty days have September,
April, June, and November.
All the rest have thirty-one
Excepting February alone.

Measures of Weight

16 ounces (oz.) = 1 pound (lb.)
2000 pounds (lb.) = 1 ton (T.)

Liquid Measure

2 cupfuls = 1 pint (pt.)
2 pints (pt.) = 1 quart (qt.)
4 quarts (qt.) = 1 gallon (gal.)

Dry Measure

2 pints (pt.) = 1 quart (qt.)
8 quarts (qt.) = 1 peck (pk.)
4 pecks (pk.) = 1 bushel (bu.)
32 quarts = 1 bushel

INDEX

Accounts, Cash, 149, 282, 283

Addition
- By endings, 4
- Carrying, 8, 9, 20
- Checking, 5, 9, 20
- Column, 5, 9
- Facts, 2-4, 20, 33
- Of decimals, 228-230, 232-235, 239, 306, 307
- Of fractions, 150, 151, 156, 157, 164, 166-169, 192, 193, 196, 197
- Of money numbers, 14, 20, 77, 102, 142, 160, 201, 208, 238
- Of whole numbers, 2-5, 8, 9, 20, 40, 77, 102, 142, 160, 208, 238
- Relation to multiplication, 26, 27
- Relation to subtraction, 2, 33
- With zeros, 40

Average, 110, 111, 135

Calendar, 161

Change, Making, 16, 256, 257

Comparing
- Fractions, 46, 88, 89, 93, 121-123, 146, 203
- Measures, 17, 93, 146, 154, 203
- Numbers, 37, 146, 147, 190, 227

Decimals
- Adding, 228-230, 232-235, 239, 306, 307
- Hundredths, 234-237
- In money, 234
- Problems about, 232, 233, 306, 307
- Relation to fractions, 228, 229, 234, 235, 306, 307
- Subtracting, 231-233, 236, 237, 243, 306, 307
- Tenths, 228-233
- Understanding and visualizing, 228, 229, 234, 235, 237, 304, 305

Denominator, 152

Division
- Bringing down in, 31, 128
- By 1-figure numbers, 30-32
- By 2-figure numbers, 96-99, 128-130, 132, 133, 136, 143-145, 208, 247
- Checking, 32, 99
- Facts, 22, 23, 33
- Fractions in quotients, 49-51, 247
- Of money numbers, 36, 135, 136, 201
- Relation to fractions, 48-51, 247
- Relation to multiplication, 22, 23, 33
- Relation to subtraction, 96
- Three-figure quotients, 132, 133
- Trial divisor, 97
- Trial quotient, 97, 143-145
- Two-figure quotients, 31, 32, 128-130, 247
- Uses of, 38
- With remainders, 30, 44, 49-51, 98, 130, 143-145, 247
- With zeros, 32, 36, 40, 133

Enrichment Material, 254-311

Equivalents
- Fractions and decimals, 228, 229, 234, 235, 306, 307

Estimating Answers, 184, 185, 294, 295

Fractional Relations
- Finding a part of a group, 88, 89, 121, 148, 276, 277
- Finding the whole when a part is known, 35, 147
- Finding what part one number is of another, 88, 89, 148

Fractions
- Adding fractions with different denominators, 192, 193, 196, 197
- Adding similar fractions, 150, 151, 156, 157, 164

Fractions (continued)
Changing fractions to higher terms, 47, 192-195, 198, 202
Changing fractions to lowest terms, 47, 92, 152-154, 202, 247
Changing improper fractions to mixed numbers, 155, 202
Changing mixed numbers to fractions, 163
Comparing, 46, 88, 89, 93, 123, 146, 203
Equivalent, 46, 47, 122, 123, 152-154
Improper, 155, 163, 196, 197
In quotients, 49, 50, 51, 247
Mixed numbers, 49, 155, 162, 163, 196-199, 216-219
Multiplying, 212-219
Of measures, 46, 88, 89, 93, 121, 154, 203
Problems about, 50, 51, 166-169, 204, 218, 219, 268, 269, 296, 297
Relation to decimals, 228, 229, 234, 235, 306, 307
Relation to division, 48-51, 247
Subtracting fractions with different denominators, 194, 195, 198, 199, 205, 243
Subtracting similar fractions, 150, 151, 158, 159, 162-164, 168, 169, 188
Terms of, 152
Understanding and visualizing, 46-48, 88, 89, 122, 123, 150-152, 162, 191-193
Uses of, 166, 167, 218, 219, 296, 297

Geometric Figures, 90, 206, 207, 212

Graphs
Bar, 118, 119, 141, 186, 187, 190, 286
Line, 240, 241

Maps
Of city blocks, 156, 194
Road, 112
Scale, 214, 215

Measures
Comparing, 17, 93, 146, 154, 203
Dry, 54, 55
Fractions of, 46, 88, 89, 93, 121, 154, 203
In cooking, 74, 75
Linear, 34, 35, 46, 262, 263
Liquid, 54, 55
Of heat, 72, 73, 274, 275
Problems about, 12, 13, 34, 35, 42, 43, 54, 72-75, 82, 83, 161, 176, 177, 209, 266, 267
Speedometer, 231, 232
Tables of, 312
Time, 12, 13, 89, 161, 224, 225, 254, 255
Weight, 42, 43, 266, 267

Mile, 35

Million, 62, 63, 270, 271, 304

Money, 14-16, 29, 36, 52, 53, 67, 135, 201

Multiplication
By 1-figure numbers, 26-29
By 2-figure numbers, 64-68
By 3-figure numbers, 79, 80
Carrying, 27-29
Checking, 68
Facts, 22, 23, 33
Of fractions, 212-219
Of money numbers, 29, 67, 81, 201
Of whole numbers, 22, 23, 26-29, 40, 64-66, 68, 80, 81, 142, 208, 246
Partial products, 68
Relation to addition, 26, 27
Relation to division, 22, 33
Short cuts in, 70
Uses of, 38, 39
With mixed numbers, 216-219
With zeros, 40, 64, 65, 80, 81

Numbers
Comparing, 37, 146, 147, 190, 227
Millions, 62, 63, 270, 271, 304
Place value of, 8-11, 27, 31, 62, 63, 137, 227, 304, 305

Numbers (continued)
Reading and writing, 62, 63, 137
Understanding relationships of, 2, 22, 26, 33, 76, 175, 227
Using round numbers, 184-187 294, 295

Numerator, 152

Perimeter, 206, 207

Problem Solving Aids
Estimating answers, 184, 185, 294, 295
Finding hidden questions, 108, 109
Finding missing numbers, 175, 205
Identifying extra numbers, 104, 105
Making up problems, 87, 131, 209
Problems without numbers, 84, 85
Selecting right processes, 6, 18, 19, 24, 25, 38, 39, 52, 53, 84, 85, 100, 101, 172, 173, 264, 308
Supplying numbers, 41, 222
Supplying questions, 86, 174, 259, 264, 278, 279, 285, 292, 293, 308
Using pictures, 35, 147, 158, 163, 190, 210, 211

Problem Units
A trip to the museum, 302, 303
Ann's room, 220, 221
Arithmetic in sports, 69
At the post office, 260, 261
Bill sees a track meet, 262, 263
Bob's cash account, 149
Bob's hens, 272, 273
Bob's records, 134, 135
Buying clothes, 288, 289
Camping out, 276, 277
Can you work old problems? 265, 309
Grocery store arithmetic, 244, 245, 256, 257
How much does a meal cost? 290, 291
How time changes, 224, 225
Keeping records, 116, 117, 134
Learning about heat, 274, 275
Long tons and short tons, 266, 267
Millions of miles away, 270, 271
Problems about money, 52, 53
Sam's fishing, 188, 189
Sam gets well, 165
The Lanes buy a house, 300, 301
Thirteen o'clock, 254, 255
Tom meets some fractions, 268, 269
Tom's club uses records, 282, 283
Travel arithmetic, 178, 179
Using a road map, 112
Using arithmetic in school, 1
Using averages at school, 280, 281
Using a price list, 244, 245
Using fractions every day, 296, 297
Using measures in cooking, 74, 75
Using parcel post, 183
Using scale maps, 214, 215
Vacation problems, 249, 310, 311

Problems
About decimals, 232, 233, 306, 307
About fractions, 50, 51, 166-169, 204, 218, 219, 268, 269, 296, 297
About measures, 12, 13, 34, 35, 42, 43, 54-57, 72-75, 82, 83, 161, 176, 177, 209, 266, 267
One-step, *(See Problems with one step)*
"Quickies," 1, 6, 7, 24, 25, 56, 57, 69, 70, 71, 82, 83, 104, 105, 120, 168, 169, 200, 204
Two-step, 106-111, 114, 115, 120, 131, 171-174, 176-179, 200, 290, 291, 302, 303
With several steps, 138, 139, 223, 226, 248, 249

Problems With One Step
Addition and subtraction, 6, 7, 18, 19, 166, 167
All four processes, 1, 41, 52, 53, 56, 57, 84, 85

Problems With One Step (cont.)
Division only, 50, 51
Multiplication only, 70, 71
Multiplication and division, 24, 25, 38, 39, 100, 101

Puzzles
Cross-number, 91, 170, 258, 284, 287
Magic square, 284, 307
Number tricks, 298, 299

Reading and Writing Numbers, 62, 63, 137

Recall and Maintenance
Cumulative Reviews, 20, 21, 23, 33, 40, 44, 45, 76-78, 81, 90, 91, 94, 95, 102, 103, 136, 142, 145, 160, 164, 191, 201-203, 205, 208, 238, 239, 242, 243, 246, 247
Diagnostic check tests, 58-61, 124-127, 180-182, 250-253

Records, Keeping
Cash accounts, 149, 282, 283
Of household expenses, 116, 117
Of poultry business, 134, 135
With a table, 140
With graphs, 118, 119, 141, 186, 187, 190, 240, 241, 286

Rectangle, 206

Roman Numbers 37

Round Numbers, 184-187, 294, 295

Scale Drawings, 212-215, 220, 221, 253, 300, 301

Square, 207

Subtraction
Borrowing, 10, 11, 162, 163, 199
By endings, 4, 5
Checking, 11, 198, 199
Facts, 2-5
Of decimals, 231-233, 236, 237, 243, 306, 307
Of fractions, 150, 151, 158, 159, 162-164, 166, 169, 188, 194, 195, 198, 199, 205, 243
Of money numbers, 15, 78, 103, 160, 201, 242
Of whole numbers, 2-5, 10, 11, 21, 40, 78, 103, 160, 208, 242
Relation to addition, 2, 33
Relation to division, 96
With zeros, 40

Tables
As records, 116, 134, 140
Mileage, 113
Of measures, 312
Parcel post, 183
Price list, 244, 245
Relation to graphs, 140, 141
Timetable, 233
Weight, 189
Visualizing number relations, 2, 4, 22, 30, 305

Thermometer
Boiling point of water, 73, 274
Freezing point of water, 72, 274
Zero on, 72, 274

Time, Telling, 12, 13, 89, 161, 254, 255

Time Zones, 224, 225

Ton, 43, 266, 267

Triangle, 207

Vocabulary
Of fractions, 152, 155, 156, 196
Of processes, 2, 3, 23, 68, 76
Words and signs, 57, 90, 91

Zero
As place holder in numbers, 62, 63, 137
In addition, 40
In division, 32, 36, 40, 133
In multiplication, 40, 64, 65, 80, 81
In subtraction, 40
On thermometer, 72, 274